This Issue Exceeds 100,000 Copies

THE JOURNAL

OF THE

American Medical Association

Subscription, $8.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 113, No. 21

COPYRIGHT, 1939, BY AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street, Chicago, Ill.

NOVEMBER 18, 1939

CONTENTS AND SUBJECT INDEX

Sulfapyridine in the Treatment of Pneumonia. Norman Plummer, M.D., and Herbert K. Ensworth, M.D., New York.....1847
Discussed by Drs. Cecil, Flippin, Smith, Thompson, Bullowa, Sutliff and Ensworth.

The Etiologic Diagnosis of Pneumonia in Children by Rapid Typing of Nasal Cultures. Franklin D. Poole, M.D., and Mildred D. Fousek, New Haven, Conn....1854

The Sulfapyridine Treatment of Pneumonia in Children. Charles Hendee Smith, M.D., and Rosa Lee Nemir, M.D., New York.....1857

Congenital Lesions of the Neck. Conrad J. Baumgartner, M.D., Los Angeles 1860
Discussed by Drs. Meyer and Baumgartner.

Pentothal Sodium: Is Its Growing Popularity Justified? Henry S. Ruth, M.D., Merion Station, Pa.; Ralph M. Tovell, M.D., Hartford, Conn.; Alexander D. Milligan, M.D., Elmvale, Ont., and Durant K. Charleroy, M.D., Philadelphia.1864
Discussed by Drs. Thomas and Knight.

Clinical Experiments with Androgens: IV. A Method of Implantation of Crystalline Testosterone. Samuel A. Vest, M.D., Charlottesville, Va., and John E. Howard, M.D., Baltimore.....1869

The Protection of Children from Tuberculous Adults. Fairfax Hall, M.D., New Rochelle, N. Y...1873

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Rapid Recovery from Type XIII Lobar Pneumonia Treated with Rabbit Serum of a Patient with Addison's Disease Under Treatment with Desoxycorticosterone. Ford K. Hick, M.D., and Broda O. Barnes, M.D., Chicago.....1875

Summary of Some Clinical Studies on Vitamin K. Erik Tage-Hansen, Copenhagen, Denmark.....1875

SPECIAL CLINICAL ARTICLE

Type Specific Polysaccharide Skin Test in Serum Therapy of Pneumonia. Joseph C. Edwards, M.D.; Charles L. Hoagland, M.D., and Lawrence D. Thompson, M.D., St. Louis 1876

COUNCIL ON PHYSICAL THERAPY 1880

COUNCIL ON PHARMACY AND CHEMISTRY 1881

EDITORIALS

Evolution of Our Knowledge of Tuberculosis 1882
Postscarlatinal Nephritis.....1883
Combined (Active-Passive) Diphtheria Prophylaxis.....1884

CURRENT COMMENT

The Christmas Seal.....1884
Testimonials of the Departed for Valentine's Meat Juice.....1884

BUREAU OF LEGAL MEDICINE AND LEGISLATION 1908

(Subject Index on next page)

A.M.A. Session. NEW YORK. June 10-14, 1940

New!—Jacksons' Cancer of the Larynx

Entirely New!—This *completely new* book—the first of its kind ever published in the United States—was written by Dr. Chevalier Jackson and Dr. Chevalier L. Jackson. It gives Otolaryngologists, Surgeons, and General Practitioners a sound guide of highest authority on the very latest methods of diagnosing and treating cancer of the larynx. It is *both operative and nonoperative* and includes not only the technic of laryngofissure, narrow and wide-field laryngectomy, but also such methods as irradiation, palliation, endoscopy, etc.

Part I is a working manual—a specific description of *what to do and how to do it.* Details of *early diagnosis,* biopsy, and grading are clearly set forth. You are told how to select—and how to carry out—the treatment best suited for the case at hand.

Part II deals with the *clinical aspects* of etiology, pathology, prognosis, etc. It includes in addition many valuable tables, summarizing cases that have been treated by the authors.

Part III covers the historical aspects of cancer of the larynx and is especially valuable as a bibliography of the whole literature of cancer.

239 Illustrations! No description of this *new* book would be complete without mention of the 239 fine illustrations. *50 of these are in full color* and were drawn by Dr. Chevalier Jackson himself.

By CHEVALIER JACKSON, M.D., Sc.D., LL.D., F.A.C.S., Honorary Professor of Broncho-Esophagology; and CHEVALIER L. JACKSON, A.B., M.D., M.Sc. (MED.), F.A.C.S., Professor of Broncho-Esophagology, Temple University. Octavo of 309 pages with 239 illustrations, including 5 plates in color. Cloth, $8.00.

See Also SAUNDERS ADVERTISEMENT on Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics; "OS," Organization Section; "SS," Student Section.

Abdomen syndromes from mesenteric nodes ab-1920
Abortions, growing frequency, Finland....1892
Acid, nicotinic, give with sulfanilamide to prevent reactions? 1902
Addison's Disease, desoxycorticosterone acetate for *1875; ab-1913
pneumonia in *1875
Alarm reaction, blood picture during....ab-1922
Allen, Willard M., appointment....1887
American Academy of Ophthalmology and Otolaryngology urge care for handicapped 1889
Academy of Pediatrics....*1873
Society of Tropical Medicine....1889
Androgens, injector for....*1869
Anemia in renal diseases....ab-1921
iron deficiency, in children....ab-1911
liver from various animals....1903
sulfanilamide, basophil stippling of erythrocytes ab-1924
Anesthesia, local, fatal to epileptic....1902
pentothal sodium; popularity justified?.*1864
topical 1901
Aneurysm, infraclinoidal, of carotid....ab-1924
Angina Pectoris from tobacco....ab-1917
Antibodies, nephrotoxic, in scarlet fever.E-1883
Aorta changes in essential hypertension..ab-1923
Appetite, relation to fever....ab-1913
Arizona State Medical Association, new office 1885
Arthritis, autohemotherapy and hyperpyrexia for ab-1915
spinal, sacro-iliac changes in....ab-1916
Ascites, differential diagnosis....1901
Asthma, ketogenic diet in....ab-1920
nausea from ephedrine used in....1903
Automobile accidents, study, Minn....1886
Bacteria obtained from mouth....ab-1914
welchii infections in pregnancy....ab-1912
Benzocaine, topical anesthetic....1901
Blood, catabolism in hypertension....ab-1921
pentothal sodium anesthesia effect on....*1867
picture during alarm reaction....ab-1922
pressure, high essential, cardiovascular changes in ab-1923
stored, biochemical changes in....1893
sulfapyridine levels *1847
Board Examinations....1904
Bones, myelogenic osteopathy....ab-1922
tuberculosis, basal metabolism in....ab-1911
Book Notices....1905
Books Received....Adv. page 38
Brain, electro-encephalography ab-1913
hemorrhage; essential epilepsy....ab-1919
war wounds, treatment....1890
Branchial Apparatus cysts....*1861
Buffalo Academy of Medicine....1887
Bureau of Investigation....1897
Bureau of Legal Medicine and Legislation.1908
Burns, topical anesthetics for....1901
Butadiene, industrial hazard....1900
Butesin picrate, topical anesthetic....1901
CCC, physicians wanted in....1889
Christmas Seal E-1884
Cold, allergy to; treatment....1900
Correspondence 1898
Council on Pharmacy and Chemistry....1881
Council on Physical Therapy....1880
Cyanosis after sulfanilamide, preventing...1902
Davidson Lecture by Dr. W. Freeman....1885
Deaths 1894
DeLee, Joseph B., 70th birthday....1885
Dermatology, French Society cancels meeting 1890
Desoxycorticosterone acetate for Addison's disease *1875; ab-1913
Diets, self selection ab-1913
Diphtheria immunization, combined (active-passive) E-1884
Dispensary enlarged, Vt. 1888
Douglas County Medical Society, 50th year.1888
Electric stimulation in peripheral paralysis..1901
Encephalitis, postvaccinal 1892
Ephedrine, nausea from....1903
Epilepsy, dilantin for....ab-1918
essential, new conceptions....ab-1919
fatal, local anesthesia....1902
Estrogens, synthetic, in menstruation and lactation ab-1919
titration in serum of pregnant....ab-1912
Eye wash, pupillary atony from?....1903
Face, plastic surgery; Safian's profilometer.1903
Families, large, Germany....1890
Fasting, therapy by....1890
Fellowships, Jacobi, offered....1889
Fetus, excessive growth complicates labor.ab-1912
Fever, appetite in relation to....ab-1913
Fistula, branchial *1861
thyroglossal duct *1862
Foreign Letters....1890
Fractures, open, surgery for....ab-1920
Freeman, Walter, Davidson Lecture by....1885
Frisco System Medical Association....1888
Gallbladder calculi, ether oil injection..ab-1923
Gastrointestinal Tract in lead poisoning.ab-1922
melanomas 1902
Goiter, national problem, Finland....1892
Gonad deficiency, implant androgen pellets.*1869
Gonadotropic Substances, titration in serum of pregnant ab-1912
Gout, pathology, Netherlands 1892
Government Services....1889
Graafian Follicle, Strassmann's test....C-1898
Handicapped children, urge care....1888
Health education service, N. Y....1887
education project, N. C....1887
public, Massachusetts Association....1886
Heart changes in essential hypertension..ab-1923
electrocardiogram after pentothal sodium.*1867
Hematuria from sulfapyridine....ab-1924
Hemorrhoids in infant; treatment....1903
Hernia in infant; treatment....1903
strain (over-exertion) in relation to...MI-1910
Histaminase for allergy to cold....1900
Hospital, American, of Paris....1890
Hygroma, cystic *1863
Industrial hazard of butadiene, isoprene and piperylene 1900
hazard of lacquer thinners....1901
osteomyelitis in milker....1903
tuberculosis in tobacco workers 1891
Infant, hemorrhoids in....1903
hernia in 1903
newborn, hepatic glycogen in....ab-1919
self selection of diets....ab-1913
"Injector" for implanting testosterone....*1869
Iron deficiency anemia in children....ab-1911
Isoprene, industrial hazard....1900
Kidneys disease, anemia in....ab-1921
tissues, antibodies against, in scarlet fever E-1883
Labor, difficult, from excess fetal growth.ab-1912
shock in; apology to Dr. Moon....C-1898
Lacquer thinners 1901
Lactation hormone of pituitary....ab-1921
stilbestrol and anhydro-oxyprogesterone.ab-1919
Lead poisoning, gastrointestinal tract in.ab-1922
Leukocytes count in atypical pneumonia.ab-1917
Library, medical history, at Kansas....1886
Liver from various animals, potency....1903
glycogen in newborn....ab-1919
Lymph Nodes, abdominal syndromes from mesenteric adenopathies ab-1920
Mahoning County Medical Society lecture program 1887
Marriages 1893
Medical Education, graduate course, La....1886
Medical Examinations and Licensure....1904
Medical Services: indigents; county's liability for medical services....MI-1910
for low income group, Mich....1886
Medicine, socialized, France....1891
Medicolegal Abstracts....1908
Meetings, Coming Meetings....1910
Melanomas, gastrointestinal 1902
Menstruation, stilbestrol and anhydro-oxyprogesterone in ab-1919
Metabolism, basal, in osseous tuberculosis.ab-1911
Methemoglobinemia after sulfanilamide....1902
Methylthionine chloride, give with sulfanilamide to prevent reactions?....1902
Michigan Medical Service....1886
Migraine, ophthalmoplegic ab-1924
Milker, osteomyelitis in; danger from?....1903
Minnesota Medical Foundation....1886
Moon, Virgil H., apology to....C-1898
Mouth, bacteria from....ab-1914
dry, or xerostomia....1902
Nausea from ephedrine....1903
Neck, congenital lesions....*1860
Negroes, rabies in Birmingham....C-1898
Nephritis, postscarlatinal E-1883
Nerve injury, diagnosis; treatment....1901
New and Nonofficial Remedies....1881
News 1885
Nose, cultures from, in pneumonia....*1854
Obstetrics, graduate course, Neb....1887
service in the home, Ia....1886
shock; apology to Dr. Moon....C-1898
Oklahoma Medical Association....1888
Optometry Practice Acts: co-operative arrangement with physician....Ml-1906
Orthoform, topical anesthetic....1901
Osteomyelitis in milker; danger from?....1903
Pain, cobra venom for relief....ab-1915
Paralysis, peripheral, electric stimulation in.1901
Pediatrics, graduate course, Neb....1887
Pellets, injector for implanting....*1869
Phenol, topical anesthetic....1901
Phenolphthalein eruptions ab-1915
Physicians, aged, pensions for, Belgium....1891
Highland Park Club....1886
wanted in CCC 1889
Piperylene, industrial hazard....1900
Pituitary, anterior, lactation hormone...ab-1921
Pneumococcus antibodies ab-1924
type specific polysaccharide skin test....*1876
Pneumoconiosis: silicosis; employer's duty to provide safe place of work....Ml-1908
Pneumonia, acetyl sulfapyridine for....ab-1924
atypical, with leukopenia....ab-1917
diagnosis: typing nasal cultures....*1854
polysaccharide skin test in serum therapy.*1876
rabbit serum in Addison's disease with.*1875
roentgen therapy ab-1916
serum and sulfapyridine free, Pa....1888
sulfapyridine for....*1847; *1857
type III ab-1924
Poliomyelitis in mountain counties, Ky....1886
Pregnancy, B. welchii infections in....ab-1912
blood in, titrating estrogenic and gonadotropic hormones in....ab-1912
Progesterone, anhydro-oxyprogesterone ..ab-1919
Puerperal Infection and streptococci....ab-1918
Pupils, atony without syphilis....1903
Qualalacq Thinner No. 631....1901
Queries and Minor Notes....1900
Rabies in Birmingham....C-1898
Rheumatic Fever, acute, treatment....ab-1913
autohemotherapy and hyperpyrexia for.ab-1915
Safian's profilometer 1903
Scarlet Fever, nephritis after....E-1883
sulfanilamide for ab-1918
Scrotum, "injector" for androgen pellets..*1869
Shock, apology to Dr. Moon....C-1898
Skin test in serum therapy of pneumonia.*1876
Smallpox vaccination, encephalitis after....1892
Society Proceedings....1910
Sodium bicarbonate, give with sulfanilamide to prevent reactions? 1902
Southern Medical Association....1889
Spine arthritis, sacro-iliac changes....ab-1916
osteomalacia from deficient diet, etc....ab-1923
State Board Examinations....1904
Strassmann's Test C-1898
Students, religious affiliation 1893
Submaxillary Gland inclusion cysts....*1863
Sulfanilamide anemia, erythrocytes in...ab-1924
prevent cyanosis and methemoglobinemia..1902
treatment of scarlet fever....ab-1918
treatment of tularemia....ab-1917
Sulfapyridine, acetyl, for pneumonia....ab-1924
state to distribute, Pa....1888
toxic reactions *1850
treatment, hematuria from....ab-1924
treatment of pneumonia....*1847; *1857
Surgery, plastic, Society of....1887
supplies, impostor sells....1889
Teachers, tuberculous, protect children from.*1873
Testis, undescended, implant testosterone..*1869
Theca interna cone: Strassmann's test...C-1898
Thyroglossal Duct cysts....*1862
Thyroid, aberrant and lingual....*1862
Tobacco, angina pectoris from....ab-1917
factory workers, tuberculosis in....1891
Tonics and Sedatives....Adv. page 30
Tuberculids, tuberculin for....1900
Tuberculosis, Christmas seal....E-1884
evolution of our knowledge....E-1882
hospital (new), New York City....1887
in tobacco workers 1891
protecting children from adults with...*1873
Tularemia, sulfanilamide and serum for..ab-1917
Tumor center, new, Brussels....1891
Typhoid outbreak from raw milk, Ill....1885
Valentine's Meat Juice, testimonials of departed for E-1884
Varicose Veins, injection method....1903
Vitamin D for spinal osteomalacia....ab-1923
K, methods of giving....*1875
War wounds, treatment....1890
White, William A., portrait....1885
Whooping Cough, agglutinative reaction.ab-1914
immunization (active) ab-1911
passive immunity in....1893

THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $8.00 a year. 25c a copy. Canadian $9.50. Foreign $12.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

CRESCENT surgeons blades
RIGIPOISED MIKRO-KEEN
and costs LESS!
WRITE FOR FREE SAMPLE
Crescent Surgical Sales Co., Inc.
440 FOURTH AVENUE
NEW YORK, N. Y.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 113, No. 21 — COPYRIGHT, 1939, BY AMERICAN MEDICAL ASSOCIATION — CHICAGO, ILLINOIS — NOVEMBER 18, 1939

SULFAPYRIDINE IN THE TREATMENT OF PNEUMONIA

NORMAN PLUMMER, M.D.
AND
HERBERT K. ENSWORTH, M.D.
NEW YORK

The only agent of proved value in the specific treatment of pneumonia heretofore has been antipneumococcus serum. While effective in many types of pneumococcic pneumonia, it has been costly, frequently unavailable, often tedious and occasionally impossible to give. The advent of sulfapyridine has given us another effective specific agent, and this time one that is comparatively inexpensive, more readily available and more easily administered.

During the year that has passed since Whitby [1] described experiments in which sulfapyridine afforded complete protection in mice against as high as 10,000 lethal doses of pneumococci, a large number of articles have appeared in the medical literature concerning the use of this new therapeutic agent.

On the experimental side, Fleming [2] has found that the drug retards the growth of pneumococci in human blood in concentrations as low as 3 mg. per hundred cubic centimeters. He [3] subsequently demonstrated that the blood of patients taking sulfapyridine has a much increased antibacterial power against the pneumococcus. MacLean, Rogers and Fleming [4] have shown that pneumococci vary in their sensitivity to the drug but that this variation is associated not with the type of pneumococcus but with the individual strain. Greey, MacLaren and Lucas [5] have shown that sulfapyridine is superior to sulfanilamide, to a glucoside derivative of 4:4′ diamino diphenyl sulfone (promin) and to hydroxyethyl-apocupreine dihydrochloride in pneumococcic infections in mice. Hilles and Schmidt [6] have reported that the drug is effective in experimental type XXII infections.

On the clinical side, reports have come from a variety of localities. In England, Evans and Gaisford [7] used sulfapyridine in 100 cases of pneumonia with a mortality rate of 8 per cent. In a control series the mortality was 27 per cent. In India, Anderson and Dowdeswell [8] in an alternated series of 100 cases observed a mortality rate of 16 per cent in the controls and 2 per cent in the treated. In South Africa, Agranat, Dreosti and Ordman,[9] in a cooperative study embracing 550 cases of pneumonia, obtained either a marked reduction in mortality (in a general mine hospital) or a shorter period of pyrexia (in native mine hospitals). In Canada, Graham, Warner, Dauphinee and Dickson [10] and Meakins and Hanson [11] have reported favorably on the drug.

In this country, Flippin, Lockwood, Pepper and Schwartz [12] in Philadelphia used sulfapyridine in a series of 100 cases of typed pneumococcic lobar pneumonia with a mortality rate of 4 per cent (excluding three cases under treatment twelve hours or less). A preliminary report has been published by us.[13] Finland, Spring, Lowell and Brown [14] have used sulfapyridine alone or in combination with serum in the treatment of 175 cases of pneumonia due to specific types of pneumococci, with good results. Encouraging reports concerning the use of the drug in childhood pneumonia have come from Barnett, Hartmann, Perley and Ruhoff [15] in St. Louis, from Wilson and his associates [16] in Cincinnati and from MacColl [17] in Durham, N. C.

A summary of the replies to a questionnaire [18] sent out by THE JOURNAL to approximately 100 physicians

---

The sulfapyridine and serum were supplied by the Lederle Laboratories, Inc.

This investigation has been conducted under a grant of the Josiah Macy Jr. Foundation.

Read before the Section on Pharmacology and Therapeutics at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939

From the New York Hospital, the Second (Cornell) Medical Division and the Department of Pathology of Bellevue Hospital and the Department of Medicine, Cornell University Medical College.

1. Whitby, L. E. H.: Chemotherapy of Pneumococcal and Other Infections, with 2-(*p*-Aminobenzenesulfonamido) Pyridine, Lancet **1:** 1210 (May 28) 1938.

2. Fleming, Alexander: The Antibacterial Action in Vitro of 2-(*p*-Aminobenzenesulfonamido) Pyridine on Pneumococci and Streptococci, Lancet **2:** 74 (July 9) 1938.

3. Fleming, Alexander: The Antibacterial Power of the Blood of Patients Receiving 2-(*p*-Aminobenzenesulfonamido) Pyridine, Lancet **2:** 564 (Sept. 3) 1938.

4. MacLean, I. H.; Rogers, K. B., and Fleming, Alexander: M. & B. 693 and Pneumococci, Lancet **1:** 562 (March 11) 1939.

5. Greey, P. H.; MacLaren, D. B., and Lucas, C. C.: Comparative Chemotherapy in Experimental Pneumococcal Infections, Canad. M. A. J. **40:** 319 (April) 1939.

6. Hilles, Carolyn, and Schmidt, L. H.: Sulfanilamidopyridine [2-(*p*-Aminobenzenesulfonamido) pyridine] in Experimental Infections with Type XXII Pneumococcus, Proc. Soc. Exper. Biol. & Med. **40:** 73 (Jan.) 1939.

7. Evans, G. M., and Gaisford, W. F.: Treatment of Pneumonia with 2-(*p*-Aminobenzenesulfonamido) Pyridine, Lancet **2:** 14 (July 2) 1938.

8. Anderson, T. F., and Dowdeswell, R. M.: Treatment of Pneumonia with M. & B. 693, Lancet **1:** 252 (Feb. 4) 1939.

9. Agranat, A. L.; Dreosti, A. O., and Ordman, D.: Treatment of Pneumonia with 2-(*p*-Aminobenzenesulfonamido) Pyridine (M. & B. 693), Lancet **1:** 309 (Feb. 11) 1939.

10. Graham, Duncan; Warner, W. P.; Dauphinee, J. A., and Dickson, R. C.: The Treatment of Pneumococcal Pneumonia with Dagenan (M. & B. 693), Canad. M. A. J. **40:** 325 (April) 1939.

11. Meakins, J. C., and Hanson, F. R.: The Treatment of Pneumococcic Pneumonia with Sulfapyridine, Canad. M. A. J. **40:** 333 (April) 1939.

12. Flippin, H. F., and Pepper, D. S.: The Use of 2-(*p*-Aminobenzenesulfonamido) Pyridine in the Treatment of Pneumonia, Am. J. M. Sc. **196:** 509 (Oct.) 1938. Flippin, H. F.; Lockwood, J. S.; Pepper, D. S., and Schwartz, Leon: The Treatment of Pneumococcic Pneumonia with Sulfapyridine: Progress Report on Observations in 100 Cases, J. A. M. A. **112:** 529 (Feb. 11) 1939.

13. Plummer, Norman, and Ensworth, Herbert: Preliminary Report of the Use of Sulfapyridine in the Treatment of Pneumonia, Bull. New York Acad. Med., 2d series **15:** 241 (April) 1939.

14. Finland, Maxwell; Spring, W. C., Jr.; Lowell, F. C., and Brown, J. W.: Specific Serotherapy and Chemotherapy of the Pneumococcus Pneumonias, Ann. Int. Med. **12:** 1816 (May) 1939.

15. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Ruhoff, M. B.: The Treatment of Pneumococcic Infections in Infants and Children with Sulfapyridine, J. A. M. A. **112:** 518 (Feb. 11) 1939.

16. Wilson, A. T.; Spreen, A. H.; Cooper, M. L.; Stevenson, F. E.; Cullen, G. E., and Mitchell, A. G.: Sulfapyridine in the Treatment of Pneumonia in Infancy and Childhood, J. A. M. A. **112:** 1435 (April 15) 1939.

17. MacColl, W. A.: Clinical Experience with Sulfapyridine, J. Pediat. **14:** 277 (March) 1939.

18. Sulfapyridine: Special Report of the Council on Pharmacy and Chemistry, J. A. M. A. **112:** 1830 (May 6) 1939.

working with sulfapyridine embodies experience with the drug in about 1,800 cases of pneumonia in adults and 650 in children. It is here stated: "While there is much to be learned about the exact place of sulfapyridine in the treatment of pneumonia, it appears to be a very useful measure in many cases when properly employed." Caution in its use is advised until more evidence of its usefulness and safety is available, and the necessity for continuation of typing is emphasized. Sulfapyridine has been accepted for inclusion in New and Nonofficial Remedies.[19]

Pharmacologic and toxic aspects have been covered by Wien [20] Long,[21] Marshall, Bratton and Litchfield,[22] Johnston,[23] Stokinger,[24] Long, Bliss and Feinstone,[25] Cooper Gross and Lewis,[26] Schmidt and Hughes,[27] Hoyt and Levine,[28] Bryce and Climenko [29] and Sutherland.[30]

That pneumococci can rapidly acquire tolerance or fastness to sulfapyridine has been demonstrated in laboratory animals [31] and in man.[32]

MATERIAL AND PROCEDURE

The present report deals with our experience and that of our associates with sulfapyridine at the New York Hospital and at Bellevue Hospital.[33] We have administered sulfapyridine to 270 patients suffering from pneumococcic pneumonia, either typical (lobar) or atypical.

As soon as the clinical diagnosis of pneumonia is made, sputum and blood are obtained for bacteriologic study and a blood count is taken; sulfapyridine therapy is then started immediately. In nearly every case one or more x-ray films of the chest are taken. Frequent urinalyses are done and blood counts are repeated.

Our routine order for sulfapyridine is for 2 Gm. as an initial dose, followed by 1 Gm. every four hours until 16 Gm. has been given. At this point it is decided whether the drug should be stopped or continued. Most of the patients need no more. Complicated cases, cases in which the response is inadequate and, in particular, the bacteremic cases are continued on the drug, usually at the 6 Gm. a day rate. A few patients have been given 0.5 Gm. every two hours. Occasionally, after the first course, the dose is increased to 1.5 or 2 Gm. or reduced to 0.5 Gm. every four hours. In some cases considerable help may be obtained from the level of free drug in the blood. For that determination we have used both the Marshall method [34] and that of Werner;[35] the latter has a short modification sufficiently accurate for clinical work. Rectal administration of the drug has been tried, but absorption is either quite small or lacking altogether.

RESPONSE

In a large majority of instances a marked fall in temperature and in pulse rate occurred within twenty-four hours, and many times this had already begun by the time the second dose of sulfapyridine had been given. Associated *pari passu* with these changes were a decrease in toxemia and a subjective improvement. Bacteremia—in some cases what appeared to be an overwhelming bacteremia—was usually promptly controlled, although the patients with bacteremia tended to have a moderate degree of fever for a week or more after the original fall in temperature. Not every bacteremic patient whose blood was sterilized recovered, however. The physical signs seem to go through the usual cycle.

TABLE 1.—*Distribution of Cases and Mortality Rate by Types*

Type	Total Cases	Deaths	Mortality Rate
I	32	2	6.3%
II	11	1	
III	44	5	11.4%
IV	10	4	
V	23	2	8.7%
VI	5	0	
VII	20	2	10.0%
VIII	23	1	4.3%
IX	1	0	
X	3	1	
XI	2	0	
XII	2	0	
XIII	2	1	
XIV	7	3	
XV	2	0	
XVI	2	0	
XVII	3	1	
XVIII	6	0	
XIX	3	0	
XX	3	0	
XXII	1	0	
XXIII	3	1	
XXIV	3	1	
XXV	5	0	
XXVIII	1	0	
XXIX	1	1	
Unclassified	36	6	16.6%
Mixed	16	2	
Totals	270*	34†	12.6%

* Serum was used in addition in 102 of the cases, as follows: type I, 26; II, 9; III, 17; IV, 4; V, 10; VI, 1; VII, 10; VIII, 15; X, 1; XI, 1; XII, 1; XIV, 2; XVII, 1; XVIII, 1; XXIV, 1; XXV, 1; XXVIII, 1.

† Eleven of these were fatal within twenty-four hours of onset of therapy. Corrected mortality, 8.5 per cent.

The marked frequency with which the temperature falls in pneumococcic infections when sulfapyridine is given, together with the fact that in other infections in which we have used the drug such a fall is much less frequent or does not occur at all (e. g. staphylococcic empyema, non-pneumococcic pneumonia), leads us to believe that the temperature response is not merely an antipyretic effect.

We have been interested in finding out whether the use of sulfapyridine would interfere with the capsule of the pneumococcus and consequently with typing. Whitby [1] observed that when mice are injected intraperitoneally with pneumococci and then treated with sulfapyridine the capsule shows degenerative changes. Telling and Oliver,[36] reporting one case, and Law-

19. Sulfapyridine: New and Nonofficial Remedies, Report of Council on Pharmacy and Chemistry, J. A. M. A. **112:** 1831 (May 6) 1939.

20. Wien, R.: Toxicity of 2-(*p*-Aminobenzenesulfonamido) Pyridine, Quart. J. Pharm. & Pharmacol. **11:** 217 (April-June) 1938.

21. Long, P. H.: Sulapyridine: Preliminary Report of the Council on Pharmacy and Chemistry, J. A. M. A. **112:** 538 (Feb. 11) 1939.

22. Marshall, E. K., Jr.; Bratton, A. C., and Litchfield, J. T., Jr.: Toxicity and Absorption of 2-Sulfanilamidopyridine and Its Soluble Sodium Salt, Science **88:** 597 (Dec. 23) 1938.

23. Johnston, F. D.: Agranulocytosis Following Treatment with M. & B. 693, Lancet **2:** 1200 (Nov. 19) 1938.

24. Stokinger, H. E.: The Absorption, Acetylation and Excretion of Sulfapyridine, Bull. New York Acad. Med., 2d series **15:** 252 (April) 1939; Proc. Soc. Exper. Biol. & Med. **40:** 61 (Jan.) 1939.

25. Long, P. H., and Feinstone, W. H.: Observations on the Absorption and Excretion of Sulfapyridine, Proc. Soc. Exper. Biol. & Med. **39:** 486 (Dec.) 1938. Long, P. H.; Bliss, Eleanor A., and Feinstone, W. H.: The Effects of Sulfapyridine, Sulfanilamide and Related Compounds in Bacterial Infections, Pennsylvania M. J. **42:** 483 (Dec.) 1938.

26. Cooper, F. B.; Gross, Paul, and Lewis, Marion: Chemotherapeutic Evaluation of Sulfanilamide and 2-(Sulfanilamido) Pyridine in Type II Pneumococcal Infections in Mice and Rats, Proc. Soc. Exper. Biol. & Med. **40:** 37 (Jan.) 1939.

27. Schmidt, L. H., and Hughes, H. B.: Absorption and Excretion of Sulfanilamidopyridine (2-Para-Aminobenzenesulfonamido Pyridine), Proc. Soc. Exper Biol. & Med. **40:** 409 (March) 1939.

28. Hoyt, R. E., and Levine, Milton: In Vitro Studies on the Action of Sulfapyridine, Proc. Soc. Exper. Biol. & Med. **40:** 465 (March) 1939.

29. Bryce, D. A., and Climenko, D. R.: Sulfapyridine in Pneumonia, J. A. M. A. **112:** 1182 (March 25) 1939.

30. Sutherland, M. E.: Agranulocytosis Following Administration of M. & B. 693, Lancet **1:** 1208 (May 27) 1939.

31. Ross, R. W.: Acquired Tolerance of Pneumococcus to M. & B. 693, Lancet **1:** 1207 (May 27) 1939.

32. May, Kenneth: A Fatal Case of Pneumococcal Meningitis, Treated with M. & B. 693, Lancet **1:** 1100 (May 13) 1939.

33. Cases observed on the First Medical Division at Bellevue Hospital are included through the courtesy of Drs. I. Ogden Woodruff and James Liebmann; on the Fourth Medical Division through the courtesy of Drs. Charles Nammack, Mennasch Kalkstein and Saul Solomon.

34. Marshall, E. K., Jr., and Litchfield, J. T., Jr.: The Determination of Sulfanilamide, Science **88:** 85 (July 22) 1938.

35. Werner, E. A.: Estimation of Sulfanilamide in Biological Fluids, Lancet **1:** 18 (Jan. 7) 1939.

36. Telling, M., and Oliver, W. A.: Case of Massive Pneumonia, Type III, with Massive Collapse, Treated with 2-(*p*-Aminobenzenesulfonamido) Pyridine, Lancet **1:** 1391 (June 18) 1938.

rence,[37] reporting two cases, observed that the capsules of pneumococci recovered from the sputum of patients being treated with sulfapyridine failed to react with the type-specific serum with which they had originally reacted. We have not been able to confirm this finding. Repeat typings are done on our patients when the original typing has not shown a fixed type (I, II, V and VII). In a series of seventy-five such retypings, capsular swelling occurred whenever pneumococci were present, even after as much as 40 Gm. of drug had been given. Furthermore, there has been no interference with the capsules of pneumococci recovered from the blood, spinal fluid or pleural exudate after as much as 200 Gm. of sulfapyridine. There was one exception to this: poor capsular swelling in organisms recovered from the blood of a patient with bacteremia and endocarditis was observed after 140 Gm. of sulfapyridine had been given, but subsequent blood cultures typed easily, even though the drug was continued.

In a more recent article, McIntosh and Whitby [38] state that they have seen capsular degeneration only in peritoneal samples and believe that the nonencapsulated coccus found by Telling and Oliver was probably present simultaneously with the original type III coccus observed but persisted in the sputum after the other had disappeared. In this connection it should be kept in mind that the bacterial flora in the sputum often changes during the course of pneumonia whether any specific treatment is given or not.

EFFECT ON THE MORTALITY RATE

Of the 270 patients with pneumococcic pneumonia in our series, thirty-four (12.6 per cent) died. If eleven cases in which death occurred within twenty-four hours of the beginning of treatment are excluded, the rate becomes 8.5 per cent. The distribution by types is shown in table 1.

It is interesting that the mortality rate at Bellevue Hospital was 15.3 per cent (10.3 per cent if twenty-four hour cases are omitted) and in the New York Hospital group, composed of seventy-six patients from a higher economic level, 5.4 per cent. The incidence of accompanying systemic disease and alcoholism was high at Bellevue Hospital and late admission was frequent.

TABLE 2.—*Distribution of Bacteremic Cases by Types*

Type	Cases	Deaths
I	6	2
II	2	1
III	6	2
IV	3	2
V	3	1
VII	4	1
VIII	4	0
X	1	1
XII	1	0
XIV	2	1
XX	1	0
XXIII	1	1
XXV	1*	0
Totals	35*	12 (34.3%)†

* Serum was used in twenty-two of the cases: type I, 6; II, 2; III, 2; IV, 2; V, 3; VII, 3; VIII, 3; XIV, 1.

† Four of these were fatal within twenty-four hours of onset of therapy. Corrected mortality, 25.8 per cent.

Thirty-five patients with bacteremia were encountered; twelve died (34.3 per cent). If four cases in the twenty-four hour group are excluded the mortality rate becomes 25.8 per cent. The distribution is shown in table 2.

In any evaluation of our statistics it must be borne in mind that, of the 270 patients with pneumococcic pneumonia treated with sulfapyridine, 102 were given serum also. The patients in this series were not alternated between drug alone and drug and serum; we now have available serum for all types, and the problem of the value of serum in conjunction with sulfapyridine is now being studied at Bellevue Hospital in a cooperative program of the First, Second and Fourth medical divisions and involves strict alternation of cases. In the present series, generally speaking, serum was used for the more seriously ill patients. For example, of the thirty-five patients with bacteremia twenty-two received serum as well as sulfapyridine. It is therefore not possible to give an exact mortality rate on the basis of the present series either for sulfapyridine alone or for sulfapyridine plus serum.

TABLE 3.—*Toxic Reactions: Based on 323 Patients Treated with Sulfapyridine*

	Cases
1. Gastrointestinal	
Nausea	165 (52%)
Vomiting	129 (40%)
Severe vomiting	35 (11%)
2. Skin	
Generalized morbilliform rash	5
Questionable, atypical, rash	2
3. Blood	
Anemia	2
Granulocytopenia	0
4. Liver	
Jaundice (preceded therapy)	1
5. Kidney	
Ureteral stone	2
Hematuria without proved stone:	
Gross	2
Microscopic	2
Nitrogen retention	3

However, the clinical recovery of a number of the patients seemed more rapid and certain when serum was used. At least from a theoretical point of view it would be rational to expect a surer response when the effect of the specific antibodies contained in serum is added to that of sulfapyridine, which apparently acts directly on the bacteria, probably by neutralization of some metabolic function or enzymatic activity,[39] and is not concerned with the immunity mechanism. It may be that the use of serum in conjunction with sulfapyridine will further reduce the low mortality rate, which, it appears, can be obtained with sulfapyridine alone. It will take some time to determine this, and until the question is determined we believe that the use of serum should not be abandoned.

BLOOD SULFAPYRIDINE LEVELS

There is a marked individual variation in absorption and acetylation of sulfapyridine. With our routine dosage we obtained blood levels of free drug ranging from traces to 25 mg. per hundred cubic centimeters.

Six patients had blood determinations made at hourly or two hourly intervals after the onset of therapy. Sulfapyridine was detected in the blood within an hour, rose steadily for about twelve hours and then began to level off. Subsequently the level in a given case usually remained fairly uniform as long as the same dosage was maintained. Increasing the dosage after this level increases the blood level, but not in proportion to the extra amount of drug given.

37. Lawrence, E. A.: Type III Pnemococcus Pneumonia: Effect of 2-(*p*-Aminobenzenesulfonamido) Pyridine in Treatment, New York State J. Med. **39**: 22 (Jan. 1) 1939.

38. McIntosh, James, and Whitby, L. E. H.: The Mode of Action of Drugs of the Sulfonamide Group, Lancet **1**: 431 (Feb. 25) 1939.

39. Whitby, L. E. H.: Chemotherapy of Bacterial Infections, Lancet **2**: 1095 (Nov. 12) 1938. McIntosh and Whitby.[38]

At what time after administration of a dose of sulfapyridine should blood be taken for determination of the blood level? In an effort to answer this we made hourly determinations in five cases and found that, once the initial period of rise mentioned is over, there is no significant variation in blood level between one dose and the next. Consequently we feel that blood may be taken at any convenient time.

Marshall and Long [40] have recently advocated the use of sodium sulfapyridine by vein when absorption of sulfapyridine from the gastrointestinal tract is poor, when prompt action of the drug is imperative or when patients are vomiting. Blake and Haviland [41] have dissolved 2 Gm. of sulfapyridine in 1 liter of 5 per cent dextrose in saline solution by heating the solution nearly to boiling; this preparation may then be given intravenously or by hypodermoclysis.

TABLE 4.—*Summary of the Fatal Cases*

Name	Age	Type	Drug, Gm.	Serum, Units	Comment
1. J. K.	65	Unclassified	16	0	Sick several weeks at home and two weeks in hospital; autopsy: bilateral patchy pneumonia
2. T. D.	55	III	6	0	12 hr. case: admitted with bacteremia on 9th day
3. M. U.	58	IV	17	0	Consolidation of right lower lobe by x-ray; improving until sudden expectoration of large amounts of foul pus; probably abscess; no autopsy
4. J. H.	71	IV	33	310,000	Arteriosclerotic heart disease with fibrillation and decompensation; admitted with bacteremia on 8th day
5. E. R.	67	Unclassified	32	0	Emaciated Negress with history of weight loss, weakness, abdominal pain for 1 year; onset indefinite; no autopsy
6. J. S.	60	III	3	0	12 hr. case: admitted late, probably during 2d week
7. P. C.	77	IV	2	0	6 hr. case: arteriosclerotic heart disease; onset indefinite
8. L. D.	60	I	6	230,000	Admitted 8th day; responded temporarily; then relapsed
9. H. B.	71	VIII	11	0	Semicomatose on admission; in bed 4 wks. previously, with practically nothing to eat
10. G. T.	56	IV	15	414,000	Bacteremic patient who failed to respond
11. H. S.	10	Unclassified	11	0	Admitted for cardiac decompensation and ascites; had respiratory infection which eventuated into pneumonia
12. C. W.	54	VII	235	300,000	Persistent bacteremia; pneumococcic endocarditis and meningitis
13. M. H.	75	Unclassified	5	0	Responded to drug; delirium caused transfer to psychiatric ward where sulfapyridine was not given; spread of pneumonia and death
14. C. W.	45	III	17	350,000	Admitted 4th day with bacteremia, 100 colonies per cc.
15. A. G.	37	I	4	240,000	12 hr. case: admitted on 8th day with bacteremia
16. J. M.	81	XXIII, XXIV	15	0	Bacteremia type XXIII; did fairly well until drug was stopped through error
17. J. K.	68	V	2	200,000	24 hr. case: could swallow only 1 dose; arteriosclerotic heart disease with fibrillation and decompensation
18. J. P.	82	III	7	130,000	24 hr. case: arteriosclerotic heart disease with fibrillation; autopsy: pneumonia and calcified aortic stenosis
19. J. S.	37	V	5	240,000	24 hr. case: admitted 7th day with bacteremia; had been on drinking bout
20. T. P.	44	VII	36	400,000	2 wks. severe alcoholism before admission about 10th day with bacteremia; blood sterilized in 24 hours
21. M. C.	70	XIV	5	0	15 hr. case: emphysema and chronic bronchitis with terminal pneumonia; parkinsonism
22. A. M.	56	XIV	2	40,000	8 hr. case: auricular fibrillation; cardiac decompensation
23. T. C.	51	XVII	28	190,000	Admitted in diabetic acidosis; temporary response to drug therapy
24. J. V.	38	Unclassified	7	0	Admitted 4th day; vomited; refused medication after 1st day
25. L. C.	62	Unclassified	17	0	Semicomatose on admission; blood pressure 190/140; drug given by Levine tube
26. A. M.	56	XXIX	15	0	Blood pressure 200/130; uremia and pneumonia
27. C. S.	66	XXIV	18	0	Admitted in cardiac failure; temporary response to drug, then became uremic
28. G. J.	40	II	2	275,000	8 hr. case: bacteremic patient admitted in extremis on 12th day
29. E. W.	67	III	4	300,000	12 hr. case: blood pressure 210/80; known arteriosclerotic heart disease for 5 years
30. R. M.	63	XIV	16	580,000	Admitted with uremia and bacteremia
31. J. M.	63	IX and XVIII	10	0	Arteriosclerotic heart disease; sudden death after temperature normal several days
32. M. H.	69	VIII and streptococcus	75	0	Arteriosclerotic heart disease; probable cardiac death
33. E. N.	17	VIII	50	100,000	Acute rheumatic fever with pneumonia
34. R. M.	12	X	10	0	Acute rheumatic fever with pneumonia and bacteremia; died 40 hr. after admission

CORRELATION OF BLOOD LEVEL WITH CLINICAL RESPONSES

Flippin and his associates found that good clinical responses occurred in cases in which the blood level was only from 1 to 2.8 mg. per hundred cubic centimeters and that there was no apparent correlation between the blood level and the rapidity of recovery. We likewise are unable to state what an "adequate" blood level might be. Some of the best responses that we have had occurred in the "lowest level" group. In several cases in which there was no prompt response, increasing the dose had no appreciable effect on the clinical course. The cases in which this was tried, however, were complicated cases; two were severely bacteremic and one was a case of empyema.

TOXIC REACTIONS

The phase of the problem concerned with toxic reactions is of great importance, and careful attention has been given to it. Our data in this regard are based on the 270 cases of pneumococcic pneumonia and in addition fifteen cases of pneumonia in which we could isolate no pneumococci, five cases of subacute bacterial endocarditis and thirty-one miscellaneous cases. The incidence of the various reactions is given in table 3.

Nausea and vomiting is almost certainly central in origin. It rarely occurs until from 4 to 6 Gm. of sulfapyridine has been given, and it has been shown [40] that giving sodium sulfapyridine by vein causes vomiting. We have found no satisfactory way to control it short of allowing the blood level to fall. Here again, however, individuals vary greatly; some vomit when the blood level is only 2 or 3 mg. per hundred cubic centimeters and others do not vomit when the blood level reaches 8 or 9 mg. Usually the drug could be continued in spite of vomiting, which frequently lessens as recovery takes place.

Four of the five patients with morbilliform rash had received between 30 and 40 Gm. of drug; the other, 16 Gm. The rash cleared promptly when the sulfapyridine was stopped.

40. Marshall, E. K., Jr., and Long, P. H.: Sodium Sulfapyridine, J. A. M. A. **112**: 1671 (April 29) 1939.
41. Blake, F. G., and Haviland, J. W. Sulfapyridine in Pneumococcal, Streptococcal and Staphylococcal Infections, read before Association of American Physicians May 2, 1939 (to be published).

A number of patients had minor falls in red blood cell counts and hemoglobin values, such as might be encountered in severe infections. Only two, however, were severe enough to cause concern; in both the hemoglobin content fell below 50 per cent. Recovery followed withdrawal of the drug.

Liver damage attributable to sulfapyridine has not been encountered clinically or at autopsy.

In our experience, toxic effects involving the kidney and ureter have been the most disturbing. In two cases, definite ureteral stones composed of sulfapyridine have been found. The first of these two patients was a woman of 40 with subacute bacterial endocarditis who received 540 Gm. of sulfapyridine over the course of three months. The blood levels ranged from 4 to 8 mg. per hundred cubic centimeters, and subjective and objective improvement occurred, but eventually she died. Microscopic hematuria was noted a few days before death. At autopsy two small white stones were found in the pelvis of one kidney which on analysis showed almost pure acetylated sulfapyridine. X-ray films were taken but they were found not to be radiopaque. There were healed kidney infarcts, but Dr.

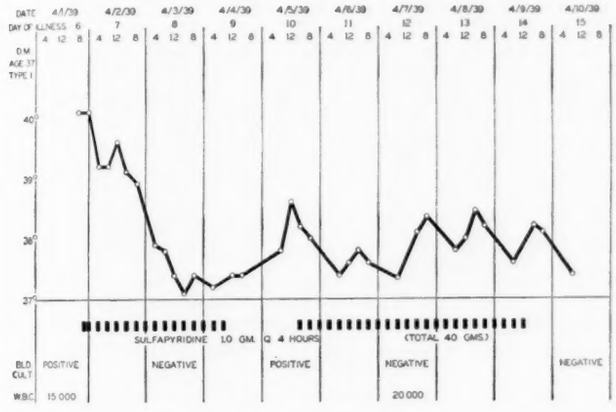

DATE 4/1/39 4/2/39 4/3/39 4/4/39 4/5/39 4/6/39 4/7/39 4/8/39 4/9/39 4/10/39
DAY OF ILLNESS 6 7 8 9 10 11 12 13 14 15
4 12 8
D.M.
AGE 37
TYPE I
40°
39°
38°
37°
SULFAPYRIDINE 1.0 GM. Q. 4 HOURS
(TOTAL 40 GMS.)
BLD. CULT. POSITIVE NEGATIVE POSITIVE NEGATIVE NEGATIVE
W.B.C. 15 000 20 000

Chart 1.—Clinical course in case 1.

Jacob Furth, the pathologist, believes that the stones caused the hematuria in this case.

In the second case, one of type III pneumonia, gross hematuria and pain in the flanks radiating down the ureters occurred after only 13 Gm. of sulfapyridine had been given. Urographic study revealed negative shadows in the kidney pelves interpreted as stones, and cystoscopy was done. Gravel was found in the bladder and ureters; on analysis this proved to be composed of acetylated sulfapyridine.

Two other patients in our series had gross hematuria. One was a seven months pregnant woman with type III pneumonia who had severe bilateral ureteral colic and hematuria after 15 Gm. of sulfapyridine had been given. Urographic study was done. One kidney pelvis was dilated, but the head of the fetus overlay this abnormality, obscuring the plates and interfering with their interpretation. No stone was passed but recovery was prompt. The other patient was a man aged 55 with the grip. After the administration of only 5 Gm. of sulfapyridine, temporary anuria occurred, followed by gross hematuria and a rise in urea nitrogen to 37 mg. per hundred cubic centimeters. He recovered when the drug was stopped, and again no stones were passed.

Microscopic hematuria was noted after administration of 16 Gm. of the drug in a man aged 68 with type III pneumonia who had no other renal symptoms or manifestations and who recovered, and also in a man aged 54 with pneumococcic endocarditis after 200 Gm. of the drug had been given. With others, we believe that the explanation of hematuria as a toxic reaction is precipitation of the quite insoluble acetylsulfapyridine in the kidney tubules and pelves and consequent mechanical damage. In the last case cited, however, it is uncertain

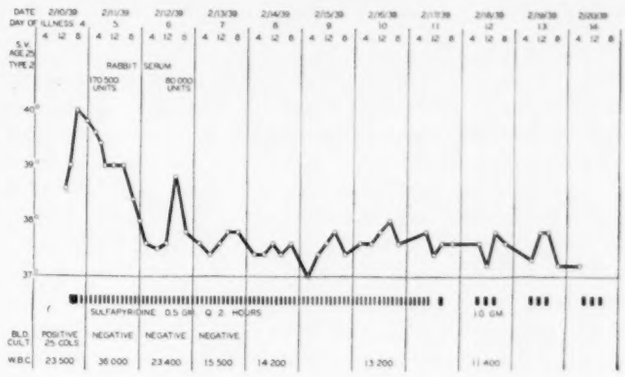


Chart 2.—Clinical course in case 2.

whether the blood came from kidney infarcts or as the result of endocarditis or was due to sulfapyridine itself. At autopsy, no stones were found but infarction was present.

In three additional cases, temporary elevation of the blood urea nitrogen was observed without other signs of kidney damage. Sulfapyridine was discontinued and prompt recovery ensued.

Besides these cases in the present series, we have first hand knowledge of the occurrence of gross hematuria—in two instances in children—in five patients not under our care. Kidney stones have been produced with sulfapyridine experimentally by Antopol and Robinson [42] and by Gross, Cooper and Lewis.[43] Lawrence [44] has reported a human case of hematuria

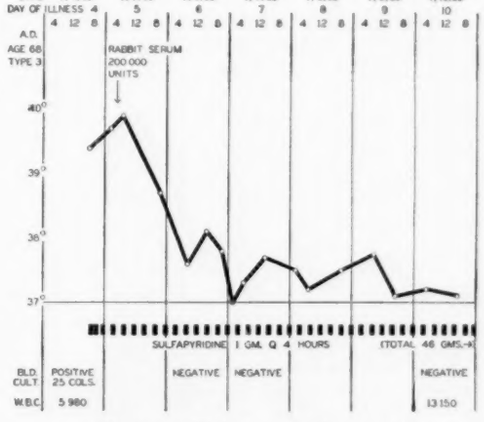


Chart 3.—Clinical course in case 3.

and renal colic due to stone, and Southworth and Cooke [45] reported three cases of hematuria, one with visible blood, in persons under treatment with sulfapyridine.

42. Antopol, William, and Robinson, H.: Urolithiasis and Renal Pathology After Oral Administration of Sulfanilylamidopyridine (Sulfapyridine), Proc. Soc. Exper. Biol. & Med. **40:** 428 (March) 1939.

43. Gross, Paul; Cooper, F. B., and Lewis, Marion: Urinary Concretions Caused by Sulfapyridine, Proc. Soc. Exper. Biol. & Med. **40:** 448 (March) 1939.

44. Lawrence, E. A.: Recent Advances in Treatment of Pneumonia, Internat. Rev. Recent Advances in Med. **3:** 48 (Jan.) 1939.

45. Southworth, Hamilton and Cooke, Crispin: Nitrogen Retention Associated with Sulfapyridine, J. A. M. A. **112:** 1820 (May 6) 1939.

COMPLICATIONS

1. *Empyema.*—This was encountered thirteen times. In all but two cases, signs suggestive of fluid were present before therapy was begun.

2. *Otitis Media and Mastoiditis.*—One patient was admitted with this condition complicating a type VIII pneumonia.

3. *Pleural Effusion.*—Six sterile nonpurulent effusions occurred. All the patients recovered on repeated thoracentesis.

4. *Endocarditis and Meningitis.*—These conditions occurred once each, in the same case. It is interesting that in this case signs of meningitis and a positive spinal fluid culture for type VII occurred three weeks after admission, but both subsequently cleared up on continued drug therapy. Recurrence was noted, however, when the patient was in a terminal state nearly three weeks later.

TABLE 5.—*Distribution of Cases by Age*

Years	Cases	Deaths
12-19	16	2
20-29	36	0
30-39	50	3
40-49	60	3
50-59	50	7
60-69	37	11
70-79	19	6
80-89	2	2

COMMENT ON THE FATAL CASES

The fatal cases are summarized in table 4. Eleven of the thirty-four patients died within twenty-four hours of the onset of therapy. Of the remaining, eight had serious organic disease affecting the cardiovascular system, two had been on drinking bouts, one was in severe diabetic acidosis on admission and one was uremic on admission. In two other cases the drug was prematurely stopped through error, and this seemed to play a part in the eventual outcome.

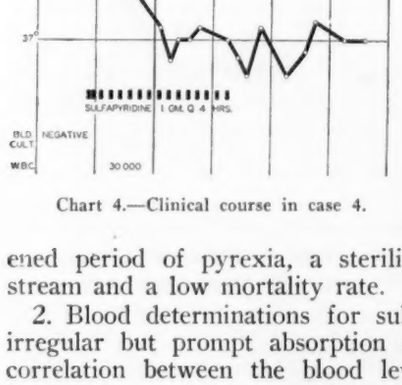


Chart 4.—Clinical course in case 4.

As table 4 suggests, no selection of cases was made, and sulfapyridine was not withheld because of the apparent terminal condition in any case.

SUMMARY AND CONCLUSIONS

1. An analysis of 270 cases of pneumococcic pneumonia reveals that treatment with sulfapyridine resulted in a shortened period of pyrexia, a sterilization of the blood stream and a low mortality rate.

2. Blood determinations for sulfapyridine show an irregular but prompt absorption and fail to show a correlation between the blood level and the clinical response.

3. The incidence of serious toxic reactions is low. Nausea and vomiting are frequent.

4. Whether serum should be administered also, particularly to seriously ill patients, is still *sub judice.*

5. Examination and typing of any available bacteriologic specimens—sputum, blood, spinal or pleural fluid—should not be abandoned. It gives information of value in diagnosis, in prognosis and in possible further specific therapy.

REPORT OF CASES

CASE 1 (chart 1).—D. M., a woman aged 37, was admitted to Bellevue Hospital on the sixth day of acute illness. Physical and x-ray examinations showed consolidation of the right lower lobe. Type I pneumococci were recovered from the sputum and from the blood. On sulfapyridine she improved, and the blood became sterile. Through error, sulfapyridine was stopped after 16 Gm. had been given, whereupon the temperature rose and the blood culture again became positive. When administration of the drug was resumed the blood again became sterile and the patient recovered, although a low grade fever persisted for nearly three weeks.

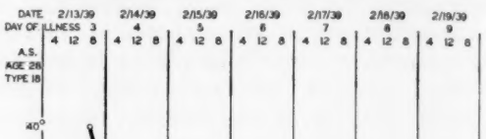


Chart 5.—Clinical course in case 5.

CASE 2 (chart 2).—S. V., a woman aged 26, was admitted to the New York Hospital on the fourth day of acute illness. She gave a past history of rheumatic fever and rheumatic heart disease. On admission the sputum showed type II organisms and the blood culture showed 25 type II pneumococci per cubic centimeter. The physical and x-ray examinations revealed pneumonia involving the right middle lobe, the right lower lobe and the left lower lobe. Sulfapyridine was started shortly after admission to the hospital. On the second and third days after admission, which were the fifth and sixth days of illness, a total of 458,500 units of type II rabbit serum was administered. The toxemia subsided promptly. Blood cultures were taken daily for the first four days and were sterile. After treatment was commenced the patient made a rapid recovery. There was no nausea or vomiting and no other reaction to either the sulfapyridine or the serum.

CASE 3 (chart 3).—A. D., a woman aged 68, was admitted to Bellevue Hospital on the fourth day of a very acute illness. On admission the sputum showed type III pneumococci and the blood contained 25 type III organisms per cubic centimeter. The leukocyte count was only 5,980. Sulfapyridine was started as soon as the clinical diagnosis of pneumonia was made. Early on the second day 200,000 units of rabbit serum was injected intravenously. The toxemia was quickly controlled. Later blood cultures were sterile. The white blood cell count rose from 5,980 to 13,150 during the period in which sulfapyridine was given. Because of the grave prognosis in such a case, the drug was continued until 46 Gm. had been given. There was no gastric irritation and no other untoward reaction.

CASE 4 (chart 4).—H. C., a Negro aged 32, was admitted to Bellevue Hospital on the fourth day of his disease. The sputum showed type V organisms. Blood culture was sterile. Physical and x-ray examination revealed consolidation of the lower part of the right upper lobe. He received 16 Gm. of sulfapyridine; recovery was prompt and uneventful.

CASE 5 (chart 5).—A. S., a woman aged 28, was admitted to the New York Hospital on the third day of illness with pneumonia involving the entire left lower lobe. On admission the

sputum showed type XVIII pneumococci. The blood culture was sterile and the white blood cell count was 14,800. Sulfapyridine was started the day of admission and was continued for three and one-half days until 20 Gm. had been administered. There was a quick response to the drug and no reactions occurred.

140 East Fifty-Fourth Street.

ABSTRACT OF DISCUSSION

DR. RUSSELL L. CECIL, New York: In these reports on chemotherapy in pneumonia one notices the strikingly low death rate. The standard death rate from pneumonia at Bellevue Hospital runs from 35 to 40 per cent. In serum treated cases this was cut about half in two. With sulfapyridine, the death rate was reduced to 12 per cent. If the cases in which death occurs within twenty-four hours are eliminated, it is 8 per cent. In a series of seventy-five odd cases that Dr. Lawrence and I have seen in private practice, the death rate runs about 5 or 6 per cent with sulfapyridine. This is a better figure than we have ever been able to obtain with serum alone. The fact remains though that when serum is used under ideal conditions, such as those obtaining at the Rockefeller Institute, at Harlem and in certain other places, the figures are almost as good as with sulfapyridine therapy, if we make an exception of type III, in which serum has not been so striking as sulfapyridine. One of the most interesting features of this paper is the remarkable effect of sulfapyridine therapy on type III pneumonia. The death rate in our work in New York has usually run around 40 to 50 per cent, some winters even higher. In Plummer and Ensworth's series the death rate in the type III cases was only 11 per cent. In thirty-eight cases of type III pneumonia which we have treated this winter in private practice, in which we had expected a death rate ordinarily of 50 or 50-odd per cent, the death rate was only 10 per cent. Pneumonia has been milder this winter than usual, but that is because the distribution of types has been different. The good old type III pneumonia is just as severe as it has ever been. The same is true of type II pneumonia. We have had a particularly high incidence of type III and a low incidence of types I and II. Take any group of type III pneumonias this winter or any other winter and they run true to form. We have a double-barreled gun for the treatment of pneumonia, and whether we need both barrels or only one remains to be seen. Dr. Bullowa and Dr. MacLeod expressed it very well when they said that serum fortifies the pneumonia patient; sulfapyridine injures the pneumococcus. For the present we must keep our serum handy and use it in severe cases along with sulfapyridine, and we must continue to type our pneumonias in order that we may get all the better oriented with regard to this new form of therapy.

DR. H. F. FLIPPIN, Philadelphia: There is less variation from year to year in the virulence of the pneumococcus in the lower types, particularly type I infections. Since last fall my associates and I have treated over 500 adult pneumonia patients with sulfapyridine. Of this number 101 represent type I. Twenty-one of these had positive blood cultures with a mortality rate of 14.3 per cent. The mortality rate for the entire type I series was 5.8 per cent. During this same time eighty-eight patients of type I were treated with various forms of therapy at the Philadelphia General Hospital. In those receiving nonspecific, serum and sulfapyridine treatments the mortality rates were 44.4 per cent, 11.5 per cent and 3.7 per cent respectively. We have found it advisable to give rather large total doses to those with blood stream infections. In such cases a total of 25 Gm. and usually more has proved necessary, as it is important to continue the drug despite a normal temperature. Some significance can be placed on the white blood count following the administration of sulfapyridine. In most instances the critical drop in temperature is closely followed by a marked reduction in the total white blood count, but if it remains elevated it is wise to look for a spread in the infection or for complications. Our experiences correspond to those of Drs. Plummer and Ensworth concerning the toxic manifestations of sulfapyridine. The gastrointestinal symptoms of nausea and vomiting have proved the most troublesome. To combat these we have used with varying success such adjuvants as intravenous chlorides, chloral hydrate, barbiturates and, more recently, nicotinic acid. Microscopic hematuria has been detected in approximately 5 per cent and gross hematuria in 1 per cent of our patients. Careful pathologic studies in the fatal cases have failed to show any evidence of renal damage attributable to the drug. This question of possible renal involvement is one that remains to be properly evaluated. We have not had enough occasions to use both serum and sulfapyridine in the same case to express an opinion as to the merits of combined therapy. At this time we feel that sulfapyridine is an effective drug in the treatment of pneumococcic pneumonia and, if used with regard for its toxic effects, it is a therapeutic agent with a satisfactory margin of safety.

DR. F. JANNEY SMITH, Detroit: In the preceding eight years at the Henry Ford Hospital, 678 adults suffering from lobar pneumonia were treated by all methods. There were 253 deaths, giving a mortality rate of 37 per cent. In the past winter seventy unselected, consecutive adult patients were treated with sulfapyridine. There were six deaths, or a mortality of 8.5 per cent. Two of the patients died after being in the hospital fourteen hours or less. If those could be subtracted, the mortality rate would be 5.5 per cent. The average amount of the drug administered was from 15 to 25 Gm. Failure of prompt defervescence in three cases led to the justifiable suspicion that another organism than the pneumococcus was responsible. Autopsy showed that in two of these instances the staphylococcus was responsible and in one the tubercle bacillus. Nausea was the common toxic manifestation. No serious effect was shown on the blood picture. Illustrating renal toxicity, one patient, a white woman aged 54 with type III pneumonia, whose treatment was begun on the eighth day, showed a 3+ albuminuria and few red cells before the beginning of the drug treatment. After 8 Gm. of the drug, anuria developed. Renal function was reestablished in two days, but a new consolidation developed on the contralateral side and death occurred without further specific treatment. Autopsy and microscopic studies showed acute toxic nephritis with tubular degeneration and focal necrosis, the picture being similar to that seen in some of the metallic poisons, particularly mercury, except that it was focal instead of diffuse. There was also present focal necrosis in the adrenals. Another patient, a white man aged 64 with type IV pneumococci in the sputum and blood, had an excellent response to the drug but died after eighteen hours of normal temperature of a ventricular tachycardia. It is impossible to state whether this complication was due to his disease or whether it was related in any way to the drug therapy.

DR. L. D. THOMPSON, St. Louis: I have observed this winter two series of cases, one treated with type specific serum and one with the drug. The series are not comparable because the serum treated patients were picked. They consisted of types I, II, V, VII, VIII and XIV but no type III patients, whereas the drug treated patients included a large number of youngsters, that is below 2 years of age, and also a large number of type III patients. However, I think that some of the figures are significant. Of the 121 type specific treated patients five died, a mortality rate of 4.13 per cent. When you consider some of the circumstances of those deaths, it is even more striking. Of the five deaths, two were in type I, one patient seen first on the fourteenth day and one seen first on the fifth day. One had type II pneumonia, seen for the first time on the eighth day. Two had type V, one seen on the sixth day and one on the twenty-first day. I can make the statement that in this series no patient seen before the fifth day was lost. Another striking feature was that in the serum treated cases we had an appreciable incidence of type VII and type VIII pneumonia with no deaths at all, although the bacteremia in type VII was 15.3 per cent and in type VIII was 5.2 per cent. In the drug treated cases, 145, we had a gross mortality of 10.3 per cent. Twenty-five odd cases of those were type III, with a mortality rate of 16 and a fraction per cent. In type VII cases, drug treated, we lost one out of four and in type VIII, drug treated cases, we lost one out of six. Neither of these deaths occurred in a case of bacteremia. In this small series the drug appeared to be definitely less

efficient for types VII and VIII than did the type specific serum. Another point of difference with the drug treated series is that three patients seen before the fifth day died, one type III, one type XVIII and one we were unable to type.

DR. JESSE G. M. BULLOWA, New York: How can we select patients who require serum as well as sulfapyridine? Drs. Bukantz, deGara and I studied the concentration of polysaccharide in the blood of twenty-five patients. Twenty-one had either small amounts or no polysaccharide. These patients all recovered after treatment with sulfapyridine, with serum and with the combination. The four patients who had large amounts of polysaccharide in the blood died. A patient with pneumococcus type VII pneumonia was seen on the third day of the illness and was refractory to serum given in large amount. The elevated temperature continued and on the ninth day, when the blood was heavily invaded, he was given serum and sulfapyridine. He was very much improved. When the sulfapyridine was stopped after a period of eight days, the patient again became ill, and on the thirty-second day of the illness he was again given sulfapyridine, with the result that the temperature and the pulse fell. During this time the patient made his own antibodies. The fall in concentration of capsular polysaccharide was coincident with clinical improvement. Then treatment was withheld for a while. He had a persistent atelectasis, which on bronchoscopy showed granulation tissue in the bronchus. The atelectasis cleared, but the blood of the patient, who was apparently getting well, was reinvaded. This time meningitis developed. The patient's organisms had apparently become fast to the sulfapyridine, and ultimately, having developed a bacterial endocarditis, he died. It is possible that pneumococci of types II and V, which are related, may be more resistant to the action of sulfapyridine than some other pneumococci. A patient 29 years of age, with a pneumococcus type II pneumonia, was treated on the third day, receiving an initial dose of 5 Gm. of sulfapyridine and 1 Gm. every four hours thereafter. Though we obtained a concentration of 7.5 mg. of free sulfapyridine per hundred cubic centimeters, the patient died on the fourth day with a rising temperature. The requirement of an adequate concentration of sulfapyridine is illustrated by a patient who had a double infection, in whom pneumococcus type IX was found in the sputum and pneumococcus type V in the blood on the third day. There were then only six colonies. He received 240,000 units of pneumococcus type IX rabbit serum; his temperature and pulse fell on the fifth day and there were antibodies for pneumococcus type IX. We did not obtain a very high concentration of sulfapyridine in spite of the unusually high dosage. On the fourth day he had 1.7 mg. per hundred cubic centimeters of blood. Apparently the sulfapyridine had no effect on the bacteremia due to pneumococcus type V; it had increased on the fifth day to 123 colonies. He died on the sixth day.

DR. W. D. SUTLIFF, New York: Drs. Plummer and Ensworth and other workers with hospital facilities are laying a firm foundation for the use of sulfapyridine in general practice. They are showing not only that sulfapyridine is an effective therapeutic agent but that it must be used with certain precautions. During the same period as that during which the authors' figures were collected, the pneumonia control division of the New York City Department of Health assembled similar figures from a large number of physicians for patients treated at home as well as in the hospital. During January, February and March 1939 a total of 1,354 reports were returned by physicians who received serum from the department of health. Pneumonia cases caused by eight different pneumococcus types were treated with serum. The fatality rate varied from 4.5 per cent for 396 serum treated type I cases to 13.7 per cent in ninety-five type II cases. Fatality rates for other types ranged between these two extremes, with the exception of type XIV, which showed the very low fatality rate of 2.4 per cent in eighty-five cases, owing in part to the fact that this type was found in children and infants in about 50 per cent of the cases. Chemotherapy was employed by the general practitioner for only 228 patients. It was apparently employed for patients who were more seriously ill, as the fatality rate of 228 patients who had both serum and chemotherapy was 17 per cent. The gross fatality rate for all patients treated with serum or treated with chemotherapy in addition to serum was 8.8 per cent. All cases of certain pneumococcus types were treated with rabbit serum, and all cases of other pneumococcus types were treated with horse serum and the results were equally satisfactory. Since April 15, when sulfapyridine was released for general sale, 126 patients treated with sulfapyridine alone have been reported to the New York City Department of Health, Pneumonia Control Division. This group of cases shows a fatality rate of 5.6 per cent, which approximates closely to that reported by Drs. Plummer and Ensworth and other observers in hospital practice. These cases all had bacteriologic diagnosis performed in the New York City Department of Health, Pneumonia Control Division stations.

DR. HERBERT K. ENSWORTH, New York: The question of picking cases for treatment with sulfapyridine or with serum or the combination is something which will have to be worked out. Fleming recently published in the *Lancet* a bacteriologic means of doing so which takes twenty-four hours. He determines whether the particular strain of the inciting organism is susceptible to sulfapyridine or not. That is an interesting way of doing it; if the process can be shortened so that we can get treatment started without undue delay it may be very valuable. Dr. Bullowa's demonstration of the significance of the polysaccharides in the urine is interesting also and it may be that from this will develop another useful aid in selecting the method of therapy most suitable for the individual patient. The present day results with serum, as Dr. Sutliff showed, are excellent. I think it shows one thing about serum, that serum is getting better; it is becoming more refined, more concentrated and more effective. All the reports of serum in recent times have shown results superior to those obtained with the serum of the older days. This also applies to type III serum, formerly thought to be of little value. We and others have seen type III pneumonia cases in which definite improvement which appeared to be due to serum has occurred. At the present time, however, sulfapyridine appears to be lowering the mortality rate in all types even more than serum does.

THE ETIOLOGIC DIAGNOSIS OF PNEUMONIA IN CHILDREN BY RAPID TYPING OF NASAL CULTURES

FRANKLIN D. POOLE, M.D.
AND
MILDRED D. FOUSEK
NEW HAVEN, CONN.

Advances in the treatment of pneumonia both with serum and with drugs have increased the importance of the etiologic diagnosis. In children, attempts to circumvent delay due to lack of sputum by obtaining tracheal specimens have been made by Bullowa [1] and by Krahulik, Rudomanski and Cunningham.[2]

Beebe,[3] Kneeland [4] and Webster and Hughes [5] reported that in respiratory infections in children the respiratory pathogens, e. g. pneumococcus, influenza bacillus and hemolytic streptococcus, appear in cultures from the nasal passages. In the middle fossae of the nose in cases of lobar pneumonia, Felty and Heatley [6] described the presence of pneumococci which corresponded to the type found in the sputum. Baker [7] found that in early pneumonia in children the highly parasitic pneumococcus type I could be quickly

From the Children's Center of the New Haven Orphan Asylum and the Department of Pediatrics of the Yale University School of Medicine.
Aided by grants from the Fluid Research Fund of the Yale University School of Medicine.

1. Bullowa, J. G. M.: The Management of Pneumonia, New York, Oxford University Press, 1937.
2. Krahulik, Lambert; Rudomanski, Victor, and Cunningham, George: Intramuscular Administration of Antipneumococcal Serum in Infants and Children, Proc. Soc. Exper. Biol. & Med. **40**: 18-21 (Jan.) 1939.
3. Beebe, Agnes R.: Personal communication to the authors.
4. Kneeland, Yale, Jr.: Studies on the Common Cold, J. Exper. Med. **51**: 617-624 (Jan.) 1930.
5. Webster, L. T., and Hughes, T. P.: The Epidemiology of Pneumococcus Infection, J. Exper. Med. **53**: 535-552 (Jan.) 1931.
6. Felty, A. R., and Heatley, C. A.: The Nasal Passages in Lobar Pneumonia, J. A. M. A. **86**: 1195-1197 (April 17) 1926.
7. Baker, Conrad: Nose Cultures in Children with Lobar Pneumonia, Thesis, Yale University, 1931.

recovered from nasal swabs through mouse inoculation. These observations led us to explore the possibility of rapid typing of pneumonia in children using the quellung reaction on pneumococci which might appear in blood broth inoculated with a nasal swab.

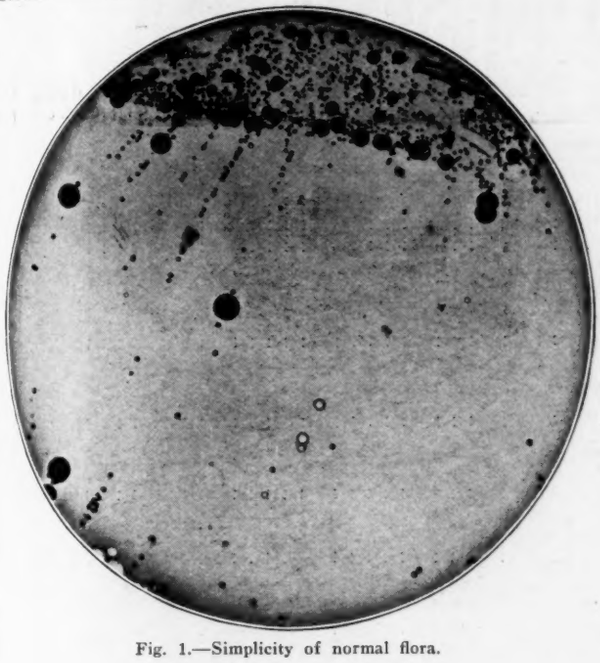


Fig. 1.—Simplicity of normal flora.

METHOD OF STUDY

The basic medium was a fresh beef heart infusion broth with 2 per cent defibrinated rabbit's blood, 1 cc. volumes being used in ordinary test tubes and kept on the desk. The beef hearts were infused within twenty-four hours of slaughtering. The small volume and storage at room temperature were used to shorten the period of incubation. The nasal swab consisted of the ordinary wooden applicator tipped with cotton. The culture of the nose was taken by passing the swabs far back into the nasopharynx. Sometimes this was possible in only one nostril. One swab was left in the tube of blood broth and incubated at 37.5 C. Another swab taken at the same time was used to streak a blood agar plate made up of fresh beef heart blood agar with 5 per cent defibrinated rabbit's blood. The second swab was then placed in a tube of plain broth; after shaking, 1 cc. of the fluid was inoculated into a white mouse.

The clinical material consisted of patients suspected of having pneumonia admitted to the pediatric service of the New Haven Hospital. Of these, thirty-two proved to have lobar pneumonia, eight bronchopneumonia, one capillary bronchitis, two bronchitis and five acute upper respiratory infections and questionable pneumonias.

RESULTS

Figures 1 and 2 are reproductions of photographs of nasal cultures on blood agar plates in a normal child and in lobar pneumonia respectively. Figure 1 (normal) shows the simplicity of the normal flora, which consists merely of diphtheroids and staphylococci. Figure 2 (pneumonia) shows the predominance of pneumococci. The facts that in cases of pneumonia one can get the pneumococci in almost pure culture from the nose and that only a small volume of medium is required constitute the basis of the success of the method.

Thirty-four cases of pneumonia and severe respiratory infections were typed by the rapid method. The time required in typing ranged from one and three-quarters hours to six hours. In the average case from three to four hours' incubation of the 1 cc. volumes of blood broth inoculated in the manner described was all that was necessary to obtain a culture suitable for a typing of the pneumococci. On the other hand, when a 5 cc. volume of blood broth was used, from twelve to eighteen hours was found to be the time necessary for incubation before the quellung reaction could be employed successfully.

The accompanying table, summarizing the cases of lobar pneumonia, bronchopneumonia and upper respiratory infections examined, shows the organisms obtained from the nose and throat, from white mouse inoculation, from blood culture and from exudates from the ear and pleural cavity.

RESULTS

The table shows a contrast between the predominance of the parasitic pneumococcus in the nasal cultures on the one hand and the variety of organisms of the throat on the other hand. Pneumococci were recovered from the nasal cultures in twenty-nine of the thirty-two cases of lobar pneumonia. In six instances a check on the method of the typing by nasal cultures was possible by means of a comparison of types found in blood cultures, pus from the ear, pleural cavity and nose; the nasal method was upheld six times (cases 1, 7, 10, 11, 14 and 18). The nasal method failed in three cases (cases 6, 23 and 32). The unsuccessful examination for pneumococci in the nose, as in cases 6, 23 and 32, was made on the first and second days of disease and could not therefore be ascribed to a late examination, as might have been expected from Baker's work.

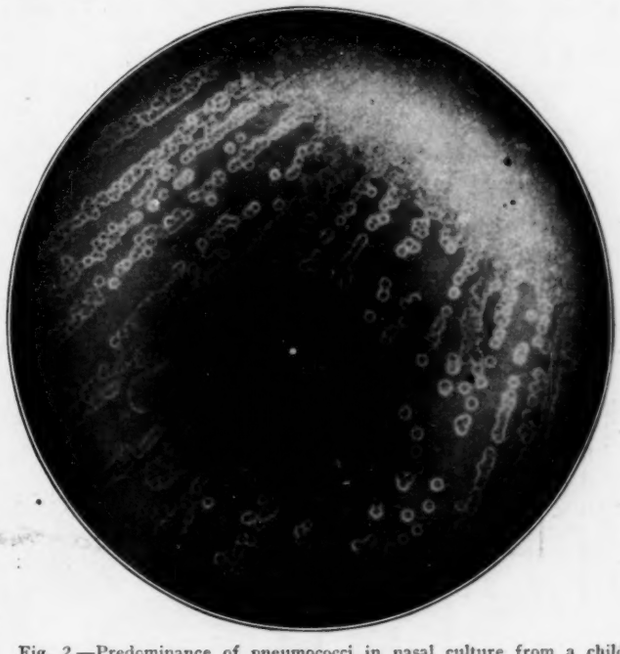


Fig. 2.—Predominance of pneumococci in nasal culture from a child with lobar pneumonia.

The three cases in which the method failed were typical of lobar pneumonia in respect to onset, physical signs and roentgenographic evidence.

Several types of pneumococci were recovered from the nose, the throat or other sources in seven cases of lobar pneumonia (cases 4, 5, 17, 21, 27, 29 and 31) and in one case of bronchopneumonia (case 34). In the three instances (cases 4, 5 and 17) in which the distinction could be made, a highly parasitic pneumococcus was found in the nasal culture.

A Comparison of Organisms from Nose and Throat Cultures, Mouse Inoculation, Blood Cultures and Exudates in Pneumonia and Respiratory Infections

Case Number	Day of Disease	Nose Culture: Pneumococcus Type	Nose Culture: Haemophilus Influenzae	Nose Culture: Staphylococcus Albus or Aureus	Nose Culture: Diphtheroids	Nose Culture: Gram-Negative Micrococcus	Throat Culture: Pneumococcus, Type	Throat Culture: Haemophilus Influenzae	Throat Culture: Streptococcus Viridans	Throat Culture: Gram-Negative Micrococcus	Throat Culture: Staphylococcus Albus or Aureus	Throat Culture: Hemolytic Streptococcus	Throat Culture: Bacillus X	Throat Culture: Mixed Flora	Organisms from Mouse: Pneumococcus, Type	Organisms from Mouse: Haemophilus Influenzae	Organisms from Mouse: Hemolytic Streptococcus	Blood Culture, Pneumococcus, Type	Purulent Exudate: Pleural Exudate, Pneumococcus, Type	Ear	Diagnosis
1	1	I*	..	+	+	..	I*	..	..	+	..	..	..	..	I	..	..	..	..	Pneumococcus I	Lobar pneumonia, suppurative otitis media
2	1	I*	..	+	..	..	I	+	..	+	+	..	..	..	I	..	..	..	..	Negative	Lobar pneumonia, suppurative otitis media
3	4	I*	..	+	..	..	I*	..	..	+	+	..	..	+	..	..	..	..	..	.....	Lobar pneumonia
4	3	I* and XX*	+	+	..	..	XX	+	..	+*	..	..	..	+	I	..	..	..	..	.....	Lobar pneumonia
5	6	I* and XIV*	+	..	..	..	XIV	+	..	+	+	..	+	+	I and XIV	..	..	..	..	.....	Lobar pneumonia
6	2	.....	+	+	..	..	..	+	..	..	+	..	..	+	..	..	..	I	..	.....	Lobar pneumonia
7	7	XIV*	+	+	..	..	XIV*	+	..	+	+	..	..	+	XIV	..	..	..	XIV	Staphylococcus, diphtheroids	Lobar pneumonia, empyema, suppurative otitis media
8	5	XIV*	..	+	..	..	XIV	..	+	..	+	+	..	+	XIV	..	..	..	..	.....	Lobar pneumonia
9	4	XIV*	+	..	..	..	XIV*	+	..	..	+	..	..	+	XIV	..	..	..	..	.....	Lobar pneumonia
10	14	XIV*	+	+	..	..	XIV*	+	..	..	+	..	..	+	IV	..	..	XIV	..	.....	Pertussis, lobar pneumonia
11	2	XIV*	..	..	..	..	XIV	+	..	..	..	..	..	+	XIV	..	..	XIV	..	.....	Lobar pneumonia
12	4	V	..	..	..	+*	V*	..	..	..	+	..	..	+	V	..	..	..	..	.....	Lobar pneumonia
13	3	V*	..	+	..	..	V*	..	..	..	+	..	..	+	V	..	..	..	..	.....	Lobar pneumonia
14	3	V*	+*	..	..	..	..	+*	+*	..	+	..	..	..	V	..	..	V	..	.....	Lobar pneumonia
15	3	VII*	..	+	..	..	VII*	..	..	..	..	..	..	+	VII	..	..	..	..	.....	Lobar pneumonia
16	4	VII*	..	+	..	..	VII*	..	..	..	+	..	..	+	VII	..	..	..	..	.....	Lobar pneumonia
17	3	VII* and X*	+	..	+	..	..	..	+	..	+	..	..	+	..	..	..	..	..	.....	Lobar pneumonia
18	3	IV*	..	+	..	..	IV	..	..	+	..	..	..	..	IV	..	..	..	..	Pneumococcus IV	Lobar pneumonia, suppurative otitis media
19	5	XXVIII	..	+	..	..	Unclassifiable	+	..	+	..	..	..	+	XXVIII	..	..	..	..	.....	Lobar pneumonia
20	8	XI*	..	..	..	..	XI*	+	..	+	..	..	..	+	XI	..	+	..	..	.....	Lobar pneumonia
21	3	XIX* and XXIII*	..	..	..	..	XIX*	+	..	..	..	..	..	+	XIX and XXIII	..	..	..	..	.....	Lobar pneumonia
22	3	XIX*	..	+	+	..	XIX*	+	..	..	..	..	..	+	..	..	..	..	..	.....	Lobar pneumonia
23	2	.....	..	+*	..	..	..	..	+	..	+	..	..	+	III	..	..	..	..	Pneumococcus III	Lobar pneumonia, suppurative otitis media
24	5	III*	..	+	..	..	..	..	+	+	..	..	..	+	III	..	..	..	..	Negative	Lobar pneumonia, suppurative otitis media
25	1	III*	..	..	..	..	III	..	+*	..	+	+*	..	..	III	..	..	..	..	.....	Lobar pneumonia
26	3	III*	..	..	..	..	..	+	+	..	..	..	..	+	III	..	..	..	..	.....	Lobar pneumonia
27	?	III*	..	+	..	..	V	+*	+	..	..	+*	..	..	III	..	+	..	..	Pneumococcus V	Lobar pneumonia, suppurative otitis media
28	1	XX*	..	..	..	..	..	..	+	..	+*	..	..	+	..	..	..	..	..	.....	Lobar pneumonia
29	2	Unclassifiable	..	+	..	..	..	..	..	..	+	+	..	..	XII	..	..	..	..	.....	Lobar pneumonia
30	6	XXIV*	..	+	..	..	XXIV*	+	..	..	..	+	..	+	XXIV	..	..	..	..	.....	Lobar pneumonia
31	6	XXXII*	..	+	+	..	..	..	+	..	+	..	..	..	III	..	..	..	..	.....	Lobar pneumonia
32	1	.....	..	+*	..	..	Unclassifiable	..	..	..	..	+	..	..	..	..	..	..	..	Staphylococcus	Lobar pneumonia, suppurative otitis media
33	5	XVII*	+	+	+	..	XVII	+*	..	..	..	..	+	..	XVII	+	..	..	..	.....	Bronchopneumonia
34	3	VI and XVII	..	+*	..	..	..	+*	+	..	..	..	..	+	VI	..	..	..	..	.....	Bronchopneumonia
35	3	XIV*	+	+	..	..	XIV*	..	..	..	+	..	..	..	XIV	..	..	..	..	.....	Bronchopneumonia
36	2	IV*	..	+	..	..	IV*	..	+	..	..	..	..	+	IV	..	..	..	..	.....	Bronchopneumonia
37	4	VI*	+	..	..	..	..	+	+*	..	..	..	..	+	VI	..	..	..	..	Pneumococcus XIX	Bronchopneumonia, suppurative otitis media
38	4	VI	+*	+	..	..	III	+*	..	..	..	..	+	+	..	..	..	..	..	.....	Bronchopneumonia
39	3	XI*	+	..	..	..	..	..	+*	+	..	..	..	+	..	..	..	..	..	.....	Bronchopneumonia
40	6	.....	+*	..	+	..	..	..	..	+	+	+	..	..	Unclassifiable	..	+	..	..	Staphylococcus, Hemolytic streptococcus	Bronchopneumonia, suppurative otitis media
41	3	VI*	..	+	..	..	..	..	+	..	..	..	+*	+	VI	..	..	..	..	.....	Capillary bronchitis
42	2	VII*	..	+	+	..	..	..	+	+	..	..	..	..	VII	..	..	..	..	.....	Bronchitis
43	1	XVII*	..	+	..	..	Unclassifiable	+	..	..	+	..	..	+	XVII	..	..	..	..	.....	Bronchitis
44	1	VI*	..	+	..	..	..	+	+	..	..	..	..	+	VI	+	..	..	..	.....	Questionable pneumonia
45	2	VI*	..	+	..	..	..	+	+	..	..	..	..	+	VI	..	..	..	..	.....	Tracheitis
46	2	VI*	+*	..	..	..	..	+	+	+	..	..	..	+	VI	+	..	..	..	.....	Upper respiratory infection
47	2	XIX*	+	..	..	..	..	+	+	..	..	..	..	+	..	..	..	..	..	.....	Questionable pneumonia
48	3	Unclassifiable	+	+	..	..	..	+	+	..	+	..	..	+	..	..	..	..	..	.....	Upper respiratory infection

* Predominating organism.

The first day of disease in the pneumonias was calculated as the first day of high fever, cough, vomiting or convulsion.

In five cases of bronchopneumonia the pneumococcus was not found in the throat culture (cases 34, 37, 38, 39 and 40) but was present in the nasal cultures in all but one (case 40). Pneumococci were absent in the throat cultures in seven cases of bronchitis, upper respiratory infections and questionable pneumonias (cases 41, 42, 44, 45, 46, 47 and 48), whereas they were present in every case in the nasal culture. In one case of bronchopneumonia the pneumococcus was not recovered from either the nose or the throat culture, but an unclassified type was obtained from mouse inoculation but not from aural exudate, which contained a hemolytic streptococcus (case 40).

SUMMARY

The method of rapid typing of nasal cultures has some limitations but is of value in the etiologic diagnosis of pneumonia. The method is of special value in pediatrics but, judging from Felty and Heatley,[6] it may be valuable also among adults. Even with the advent of chemotherapy in pneumonia the method still is of importance, because it is desirable to know whether or not the inciting agent is a pneumococcus or a hemolytic streptococcus. If the etiology is pneumococcic it is important to recognize the high parasitic strains which usually occur in lobar pneumonia and to recognize those strains which are more common in bronchopneumonia or the so-called "atypical" or viral pneumonias.

THE SULFAPYRIDINE TREATMENT OF PNEUMONIA IN CHILDREN

CHARLES HENDEE SMITH, M.D.
AND
ROSA LEE NEMIR, M.D.
NEW YORK

There have been a number of reports concerning the use of sulfapyridine in the treatment of pneumonia in infancy and childhood during the past few months.[1] A review of the literature will not be made here. The present series of ninety-three cases is reported because of the successful results in lobar (pneumococcus) pneumonia from the use of the drug in small doses and for a short time.

These patients were treated with sulfapyridine in the Children's Medical Service of Bellevue Hospital between January and July 1939. All patients under 12 years of age having pneumonia had a bacteriologic study with cultures from the throat by the technic described[2] for pneumococcus typing and blood agar plates for streptococcus study in many cases (table 1). No attempt was made to have a control series, since the early results made it seem unfair to withhold the drug from sick children. Our experience with many hundreds of cases during the past years is a reasonable index of the expected course and outcome of pneumonia in childhood. All patients had roentgenograms taken during the pneumonia with anteroposterior and lateral views, often repeated.

The diagnosis of the clinical forms of pneumonia was made on the basis of criteria previously outlined.[3] The varieties studied during this period are noted in table 2. The majority of the patients had lobar pneumonia (seventy-nine of the ninety-three), distributed from 2 months to 13 years of age. There were twenty-nine patients under 2 years with lobar pneumonia and fifty over 2 years (table 1). All of the eleven patients with bronchopneumonia were under 2 years of age.

Sulfapyridine was given by mouth, in most cases crushed and mixed with cereal, apple sauce or fruit juice. It was usually given shortly after a meal to minimize the possibility of nausea or vomiting. In the early cases 0.2 Gm. per kilogram of body weight (1½ grains per pound) was given on the first day, and half this amount on the subsequent days. We soon found that equally prompt defervescence was observed with three fourths of this dosage in children over 2 years. The infants, however, seemed to require the original dosage, and this was continued for them. No child received more than 4.5 Gm. a day, and the average total amount given to a child was 5.48 Gm. The average total dosage for an infant under 2 years was 3.99 Gm.

Half of the patients were treated for only two days and 75 per cent for not more than three days. The average duration of treatment was 2.6 days. It is our experience that if sulfapyridine affects the course of the pneumonia it does so within eighteen to thirty-six hours. In the first few cases treated it was given for from five to six days after the crisis, but the prompt fall of temperature after the drug is begun led us to shorten the time of administration. In the larger part of this series the drug was continued for only eighteen to twenty-four hours after the crisis. No definite recurrences of pneumonia have been noted. Five patients had subsequent short rises of temperature, probably not true relapses of pneumonia.

Blood sulfapyridine determinations were done on many but not on all patients. The concentration was found to vary widely with the same dosage of drug, from less than 1 mg. to 12 mg. per hundred cubic centimeters. Three patients whose concentration was 0.8 mg. per hundred cubic centimeters had a crisis completed within eighteen hours after the drug was given. The average blood sulfapyridine determination was from 2 to 4 mg. per hundred cubic centimeters, and with this level in most cases prompt crisis was noted.

UNFAVORABLE REACTIONS

The most frequent reaction was vomiting, usually of only one or two doses, occurring in 15 per cent of the patients. This symptom was never severe enough to require stopping the drug. Vomiting can be greatly reduced by giving the sulfapyridine with food or directly after meals, a precaution which is often neglected in hospital practice. None of the patients became cyanotic from the drug, although several were cyanotic when it was first given. Extreme restlessness and delirium were observed in four patients, one of whom had a blood sulfapyridine concentration of 12 mg. per hundred cubic centimeters, the highest in our series. This baby had a peculiar agitated expression and constantly threw himself about. His extreme restlessness required the use of

From the Department of Pediatrics, New York University, and the Children's Medical Service of Bellevue Hospital.

Subject matter presented before the Panel Discussion on Management of Pneumonia in Infancy and Childhood, Section on Pediatrics, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Ruhoff, M. B.: The Treatment of Pneumococcic Infections in Infants and Children with Sulfapyridine, J. A. M. A. **112**: 518 (Feb. 11) 1939. Flippin, H. F.; Lockwood, J. S.; Pepper, D. S., and Schwartz, Leon: The Treatment of Pneumococcic Pneumonia with Sulfapyridine, ibid. **112**: 529 (Feb. 11) 1939. Wilson, A. T.; Spreen, A. H.; Cooper, M. L.; Stevenson, F. E.; Cullen, G. E., and Mitchell, A. G.: Sulfapyridine in the Treatment of Pneumonia in Infancy and Childhood, ibid. **112**: 1435 (April 15) 1939.

2. Vinograd, Julia; Nemir, Rosa Lee, and Park, W. H.: The Rapid Typing of Pneumococci by the Neufeld Reaction Directly from Laryngeal Swabs from Infants and Children, Am. J. Dis. Child. **51**: 792 (April) 1936.

3. Smith, C. H.; Graef, Irving, and Andrews, Elizabeth T.: Value of Large Sections of the Lung in Pathologic Study of Pneumonia, Am. J. Dis. Child. **45**: 1141 (May) 1933; Grad. Fort. New York Acad. Med., Oct. 22, 1935.

restraints to prevent falling out of bed. This agitated restlessness is not a part of any pneumonia picture. All four of these patients presented an alarming state; they had a peculiar intense pallor, although they were not anemic. They were improved by sedatives (phenobarbital), by a large amount of fluids and by discontinuing the drug for one or two doses. Two of these babies were placed in oxygen tents without improvement of the nervous symptoms. A transient mild hematuria was observed in one patient. This child had received only 0.12 Gm. per kilogram of sulfapyridine; hematuria appeared on the third day of treatment and cleared within a few days. It must be pointed out that hematuria occasionally occurs in pneumonia without the use of sulfapyridine. No other toxic symptoms were observed.

TABLE 1.—*Bacteriology and Age Distribution of Patients with Pneumonia*

	Only One Pneumococcus				More Than One Pneumococcus			
	Under 2 Years		2-13 Years		Under 2 Years		2-13 Years	
Pneumococcus Type	Lobar	Other Forms of Pneumonia	Lobar	Other Forms of Pneumonia	Lobar	Other Forms of Pneumonia	Lobar	Other Forms of Pneumonia
I	2*	..	7	..	1	..	1	..
III	2	..	1	..	..	2	..	..
IV	1	..	1	..	..	..	2	..
V	..	1	4	..	..	..	1	..
VI	4	1†	4	..	1	2†	5	1
VII	1	..	..	..	1	..	2	..
VIII	..	..	1	..	1	..	1	..
XI	..	..	..	..	..	..	3	..
XII	..	..	..	..	1	..	..	..
XIV	4	1†	5	..	4	1	3	..
XV	2	..	1	..	..	..	..	..
XVI	..	..	..	..	..	..	4	..
XVII	1	..	1	..	2	..	1	..
XVIII	..	..	..	..	1	..	2	..
XIX	1	2†	1	..	2	3†	6	1
XXII	1	..	..	..	..	..	1	..
XXIII	..	..	..	..	2	1	..	..
XXIV	1	..	..	..	..	..	1	..
XXIX	..	..	..	..	..	1	..	..
XXXI	..	..	..	..	..	1	..	..
XXXIII	..	..	..	..	..	..	1	..
Pneumococcus unclassified	1	..	6	1	..	1	1	..
No pneumococcus	1†	..	5	..	..	..	..	..
Str. viridans	..	1*	..	..	..	..	..	..
Total patients	22	6	36	1	7	6	14	1

* One case of empyema in each pneumococcus type as indicated.
† One patient died in each pneumococcus type as indicated.

RESULTS

The prompt and consistent precipitation of crisis following the oral administration of sulfapyridine has been reported by many observers, and our experience is no different. This reaction occurred within eighteen to twenty-four hours in sixty-nine of the seventy-nine patients with lobar pneumonia. Of course, it is possible that the drop in temperature of some of the patients coincided with the normal crisis, but such an explanation cannot account for all the reactions, particularly in those treated very early in the disease. Many of the patients treated on the eighth to the eleventh day were acutely ill with type XIV pneumonia, in which the average duration is from eight to fourteen days.[4]

It has been stated that, although sulfapyridine provokes a crisis, the disease runs its course, and the consolidation does not resolve sooner than it would have done if untreated. This suggestion is contrary to our experience. The x-ray shadows and the physical signs begin to clear at once just as they do after a normal crisis.

The three patients with lobar pneumonia who failed to show the typical response to sulfapyridine were all infants under 2 years of age, all severely ill. It is possible that the sustained temperature in the first one of these patients was a febrile evidence of sulfapyridine intolerance or intoxication, since this baby had other signs of reaction, namely extreme restlessness, delirium, pallor and marked anorexia. His blood sulfapyridine determination was 12 mg. per hundred cubic centimeters. The second patient is remarkable only because he required forty-eight hours' therapy to produce a crisis. The third baby had pneumonia three times previously at Bellevue Hospital, some of these atypical pneumonia. We cannot explain his unusual reaction to sulfapyridine.

In five cases of lobar pneumonia, although the usual reaction occurred after sulfapyridine, secondary short febrile rises occurred. It has been suggested that the bacteriostatic action of sulfapyridine may produce improvement for a short time and then be followed by a relapse. There were only five patients whose temperature charts might be so interpreted. Only one of these cases clinically appeared like a pneumonia during the second temperature rise which yielded promptly to renewed treatment. The dosage of sulfapyridine was probably inadequate in case 5, but readministration of the drug was followed by prompt crisis. The other three patients had no new signs of pneumonia. One of these received no more drug, and the fever subsided just as promptly as in the cases in which it was given, so that it is not certain that any patients had true relapses. Short febrile episodes are often seen in hospital patients from insignificant causes. These three patients may all have had transient fever not associated with pneumonia. Roentgenograms in all five cases showed clearing pneumonias and no new consolidation. It is noteworthy that four of the five patients had pneumococcus type XIV pneumonia, a disease known for its severity. It is suggested also that type XIV pneumonia may require a somewhat greater dosage than the other pneumococcic pneumonias.

TABLE 2.—*Clinical Diagnosis of Patients Studied*

	Number of Patients			
	Total	Lived	Died	Empyema
Lobar pneumonia	79	78	1*	2*
Bronchopneumonia	11	7	4†	1†
Lobular pneumonia	1	0	1 (autopsy)	
"Subacute" pneumonia‡	2	2		

* Patient who died had pyopneumothorax, pneumococcus unclassified 1-32.
† One infant died and was found to have pneumothorax XIX empyema.
‡ Type of pneumonia described by Lincoln, E. M.; Smith, C. H., and Kirmse, T. W.: Subacute Pneumonia in Children, J. Pediat., to be published.

In eleven cases of true bronchopneumonia we have failed to observe the same dramatic, prompt response to sulfapyridine seen in cases of lobar pneumonia. The temperature of the patients with bronchopneumonia remained elevated, and they seemed only slightly improved. Our series of this form of pneumonia this year is small, however. Four of the eleven patients died, approximately the average mortality rate for bronchopneumonia during the past eight years. A much longer time will be needed to evaluate sulfapyridine therapy in this form of pneumonia. Kohn [5] reports no

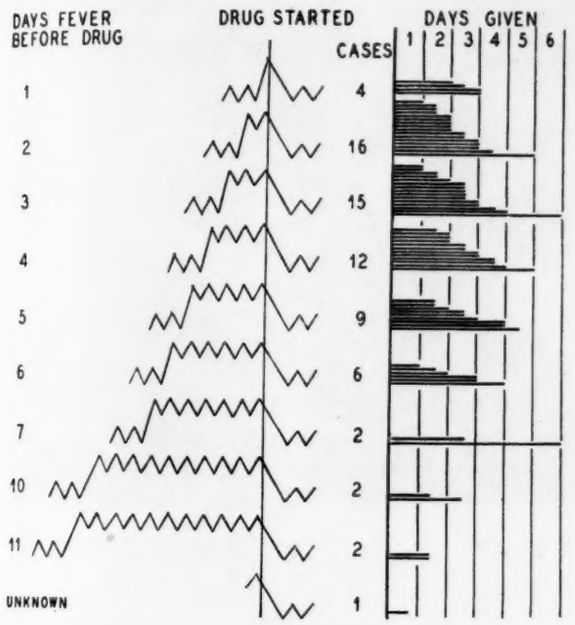
4. Nemir, Rosa Lee: The Significance of Pneumococcus Typing in the Pneumonias of Childhood, read before the Section on Pediatrics, American Medical Association, St. Louis, May 18, 1939, to be published.

5. Kohn, Jerome, et al.: Sulfapyridine Treatment in Infants and Children, Including Treatment of Pneumonia During Pertussis, read before American Academy of Pediatrics, Region I, New York, in June 1939; abstr., J. Pediat. **15**: 449 (Sept.) 1939.

effect on bronchopneumonia in his experience at the Willard Parker Hospital.

One patient clinically thought to have bronchopneumonia died and at autopsy was found to have lobular pneumonia, probably from aspiration. The walls of the bronchi were normal. This 6½ months old baby was admitted to the hospital for a diarrhea from which he was recovering when he developed pneumonia. Type XIX pneumococcus was found. The baby was treated promptly with sulfapyridine but died within thirty-six hours after the onset of the pneumonia.

There was one death among the seventy-nine patients with lobar pneumonia. This severely ill 16 months old baby died suddenly on the third day after admission to



Typical response of sixty-nine cases of lobar pneumonia in which there was a crisis within twenty-four hours after sulfapyridine was started. At the right is shown the number of days the drug was given in each case. Note the short duration of its administration in all except a few (early) cases.

the hospital. A roentgenogram taken the day before death showed a pyopneumothorax (not diagnosed clinically), which was probably responsible for the death. No autopsy was obtained.

Only one patient developed empyema, an infant with type I lobar pneumonia. He developed physical signs, and a roentgenogram indicated suppurative pleurisy. On pleural tap 2 cc. of thick pus was removed, from which type I pneumococcus was cultured. No further pus was ever found and the patient promptly recovered. This abortive course of empyema has been rarely encountered in our many years of observation of empyema, especially that following type I pneumonia.

Pneumococcic bacteremia was found in only one patient, a boy of 8 years, with type I lobar pneumonia. His defervescence occurred within eighteen hours in the typical manner. The drug was cut after thirty-six hours, and the report of the blood stream invasion was obtained after the drug had been discontinued. Even with this small amount of therapy, the blood stream was sterile. As a precaution the drug was readministered for twenty-four hours, but all further blood cultures were sterile. Streptococcus viridans was found in two blood cultures from a patient with bronchopneumonia. The blood cultures were sterile after several days' treatment with sulfapyridine, and the patient recovered.

COMMENT

The consistent prompt crises observed in our patients with lobar pneumonia following the oral use of sulfapyridine is convincing to us that the drug is very efficacious in treating pneumococcic pneumonia (and perhaps also that due to the streptococcus). But the value of a therapeutic agent in pneumonia cannot be established in one season's time, since pneumococci are known to vary in their distribution and virulence from year to year. It may be that results will be less good in more serious epidemics.

In the present season we have had a lower percentage of type I pneumonia (10.9 per cent for the present year as compared to 17.8 per cent average for the past six years). There were probably more mild cases this season than usual, although many patients were very severely ill.

The failure of bronchopneumonia to respond favorably to sulfapyridine may be explained on the basis of etiology, since the bacteriology is variable and often no pneumococci are found. If a filtrable virus is the etiologic agent of bronchopneumonia, as has been suggested by various workers and by some experimental work with animals,[6] the explanation for the different reactions of these patients to the drug is probably indicated. Sulfapyridine has not been especially useful for diseases due to filtrable viruses.

For the older child sulfapyridine may well be the answer to the treatment of lobar pneumonia in the great majority of cases. In this age group (2 to 13 years) pneumonia is a milder disease with a much lower incidence of bacteremia and deaths than in adults. Even though the death rate in children may not be greatly affected, since it is already low, the shortening of the disease and the avoidance of complications justify the use of the drug. There may always be some patients who will require specific antipneumococcus serum therapy as well as the bacteriostatic agent sulfapyridine. Infants who are debilitated, chronically ill or anemic and who may be unable to produce their own immune bodies may need specific serum as well as sulfapyridine. The necessity for obtaining a pneumococcus typing, preferably before chemotherapy is given, is clear. If sulfapyridine is not effective in the usual time, from eighteen to twenty-four hours, specific serum may be given without delay if typing has already been done. In comparing results from different clinics with sulfapyridine in pneumonia, it is important to compare the results with reference to the types of pneumococci. It is known that the duration, severity and fatality of pneumonia is directly associated with the pneumococcus types.

We wish to reiterate that it is not necessary to continue sulfapyridine for many days in the fear of a relapse. In this series the drug was given only 2.6 days on an average. If the few early cases are excluded, this time drops to 2.3 days. The average total amount was 3.99 Gm. for infants under 2 years and 5.48 Gm. for patients 2 years of age and over. The largest amount given to any patient was 13.25 Gm. The advice to "try to stop the drug after 300-450 grains (20-30 Gm.) have been given"[7] seems unwise in suggesting that these large amounts are usually needed. Sulfapyridine may be a poisonous drug in some cases, as is indicated by the reports of cyanosis, hematuria, leuko-

6. McCordock, H. A., and Muckenfuss, R. S.: Similarity of Virus Pneumonia in Animal to Epidemic Influenza and Interstitial Bronchopneumonia in Man, Am. J. Path. **9**: 221 (March) 1933.

7. Report of the Committee on Immunization and Therapeutic Procedures, American Academy of Pediatrics, June 1939, p. 13.

penia, delirium, liver damage and even death associated with the use of the drug. We believe that sulfapyridine should be given no longer than is necessary to effect a crisis and should be stopped very soon thereafter. To continue medication longer is unfair to the patient, just as it is with any drug having a cumulative poisonous action. The fact that we have observed no true relapses and have had no toxic symptoms of importance indicates the value of a wider trial of the small dose and short administration. Others [5] have produced a crisis by one day's treatment and even by a single large dose.

RESULTS

1. From January to July 1939, ninety-three patients were treated with sulfapyridine; seventy-nine with lobar pneumonia, eleven with bronchopneumonia, one with lobular pneumonia and two whose pneumonia was classified as "subacute pneumonia."

2. In bronchopneumonia there was no apparent effect on the course in any of the eleven patients, four of whom did not survive.

3. In uncomplicated lobar pneumonia with small dosage, for two or three days only, a crisis occurred within eighteen to twenty-four hours in seventy-four of the seventy-nine cases. In the five other cases crisis occurred in forty-eight hours. One death occurred from pyopneumothorax. The short duration of therapy is emphasized not only because of its success but also because of the very few untoward reactions observed.

Twenty-Seventh Street and First Avenue.

CONGENITAL LESIONS OF THE NECK

CONRAD J. BAUMGARTNER, M.D.
LOS ANGELES

The neck with its complex embryologic evolution is particularly subject to developmental anomalies. Among these may be mentioned branchial cysts and fistulas, cystic hygromas, submaxillary and submental inclusion cysts, dermoids, an accessory auditory canal, a lingual thyroid and an aberrant thyroid.

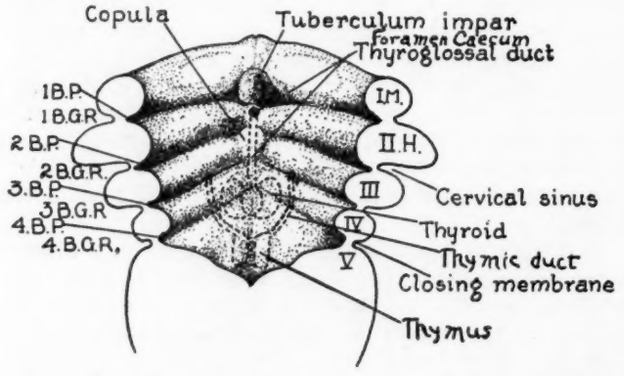


Fig. 1.—Schematic drawing showing development of branchial apparatus. I. M., mandibular arch; II. H., hyoid arch; III, IV, V, third, fourth and fifth branchial arches; 1 B. P., 2 B. P., 3 B. P., first, second and third branchial pouches; 1 B. G. R., 2 B. G. R., 3 B. G. R., 4 B. G. R., first, second, third and fourth branchial grooves.

Successful surgical assault of any congenital lesion consists of a complete reversal of the embryonic processes causing the condition in question. Obviously, in the subject being discussed at least a working knowledge of the embryologic anatomy of the neck is essential. The frequency of recurrences noted following surgical attack is evident testimony to the fact that a fundamental knowledge of the subject is not generally held. In the short space allotted, therefore, I shall sketch diagrammatically a rough working model of some of the embryology of the neck and its relationship to some of the common anomalies.

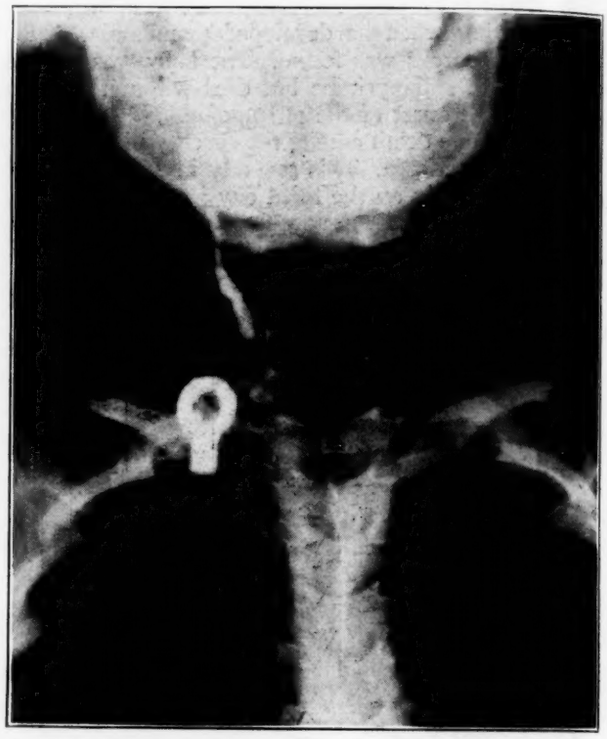


Fig. 2.—Appearance of branchial fistula tract which has been injected with iodized oil. Note direction corresponding to the sternomastoid muscle and medial arching of the tract at the level of the middle portion of the posterior belly of the digastric muscle.

EMBRYOLOGY

Although noteworthy studies of the branchial apparatus have been made by His, Rathke, Born and others, undoubtedly the greatest single contribution is that of Wenglowski,[1] who in 1912 published a monograph giving the results of a detailed study of serial sections of a large number of human embryos from 2 to 49 mm. in length. The clinical applications of these results were shown by Herbert Willy Meyer [2] in a series of studies published in 1932.

During the second week of embryonic life certain changes take place in the fetal foregut (fig. 1). From the interior lateral walls five outpouchings occur. These are the branchial pouches. Simultaneously the external ectoderm becomes indented over the corresponding pharyngeal pouches. These are the branchial grooves. The pouches and grooves approach each other so that entoderm and ectoderm come into contact, the contracting area being the closing membranes, which in gill bearing animals disappear, forming the gill clefts, which open from the pharynx to the exterior. The mesoderm is thus pushed aside into six rounded bars, the branchial arches, of which the first two partially telescope over the remainder, forming the cervical sinus. Each arch

Read before the Section on Surgery, General and Abdominal, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Wenglowski, R.: Ueber den Halsfisteln und Cysten, Arch. f. klin. Chir. **98**: 151-208, 1912.
2. Meyer, H. W.: Congenital Cysts and Fistulae of the Neck, Ann. Surg. **95**: 226-248 (Feb.) 1932; footnote 3.

contains a cartilaginous bar and in each is also the anlage of one of the primitive aortic arches.

The first or mandibular arch gives origin to the muscles of mastication, lower lip, mandible and anterior part of the tongue, while the cartilaginous bar forms portions of the middle ear and mandible. From the second or hyoid arch are developed the structures of the upper part of the neck and from its cartilage the styloid process, the styloid ligament, the lesser cornu of the hyoid and, with assistance of the third arch, the body of the hyoid and posterior part of the tongue.

The remaining arches all give origin to structures in the vicinity of the hyoid, the sixth giving origin to the cricoid, arytenoid and tracheal cartilages.

As to the branchial grooves, no traces persist of any with the exception of the first, which gives origin to portions of the auricle and external acoustic meatus and with it the possible, although rare, congenital anomaly of the accessory ear.

Proceeding to the interior, one notes that from the first branchial pouch are formed the auditory tube and the tympanic cavity, the tympanic membrane arising directly from the first closing membrane. In the second pouch lies the angle of the tonsil; but of particular significance is the third pouch.

BRANCHIAL CYSTS AND FISTULAS

Wenglowski[1] demonstrated that from the third pouch on either side two tubules descend into the mediastinum to form the thymus. The course of these

Fig. 3.—Excision of branchial fistula, showing armamentarium and method of massaging methylene blue into the tract. (By courtesy of Surgery, Gynecology and Obstetrics.)

tubules is in the general direction of the sternomastoid muscles, laterally to the thyroid and anterior to the carotid sheath. Furthermore, Wenglowski was able to demonstrate remnants of this tubule in adult necropsy dissection.

There are several theories regarding the evolution of branchial cysts and fistulas: 1. That they are caused by vestigial remains of the branchial grooves or pouches. 2. That they are a result of an embryonic perforation of the closing membrane. 3. That they are a persistence of the cervical sinus formed by a telescoping of the rapidly growing first and second arches over the remaining arches. 4. That they are due to remains of the thymic duct, which descends from the third pharyngeal pouch, as demonstrated by Wenglowski in 1912.

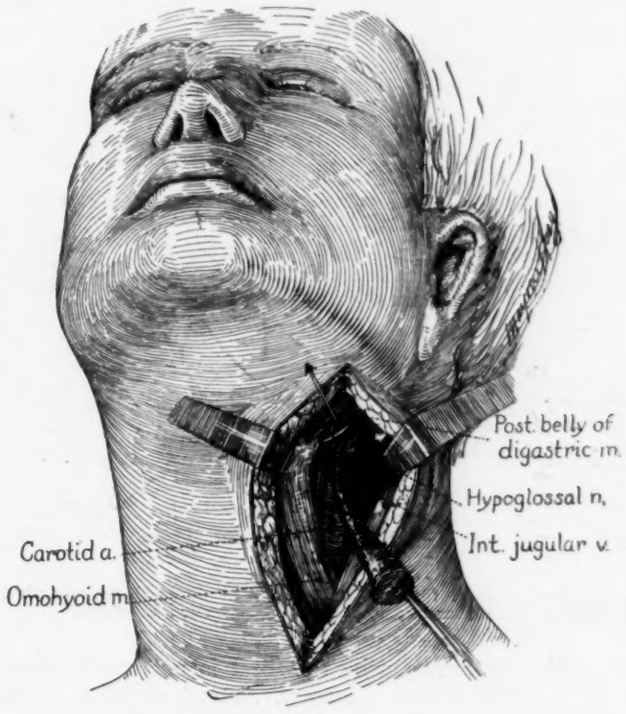


Fig. 4.—Branchial fistula. The tract lies along and beneath the sternomastoid muscle and extends up to the midportion of the posterior belly of the digastric, where it arches medially to enter the tonsillar fossa.

Now as one compares the anatomic direction of the descent of the thymic duct with that of so-called branchial cysts and fistulas, one finds a rather exact corollary. Clinically these manifest themselves as a fistula or cyst containing a mucoid or milky material, having a uniformly characteristic position along the anterior border of the sternomastoid, extending under it but lying anterior to the carotid sheath. Although occurring at any level of the neck, the tract invariably runs upward beneath the anterior portion of the sternomastoid muscle to the posterior belly of the digastric, where it arches medially behind the stylopharyngeus muscle to end in the tonsillar fossa. The course can at times be demonstrated by x-ray examination preceded by iodized oil injection of the tract (fig. 2). The tract is lined with ciliated epithelium and layers of squamous epithelium surrounded by stroma infiltrated with round cells. As Herbert Willy Meyer has pointed out in his studies in 1932[3] and again in 1937,[4] these have nothing whatever to do with any branchial cleft affairs and should therefore be considered as thymic duct cysts and fistulas. Complete removal to the pharynx is of course necessary. I prefer to inject the tract with methylene blue (fig. 3) and follow this with a saline irrigation to remove the excess stain. This prevents discoloration of the surrounding territory during the dissection to

3. Meyer, H. W.: Congenital Cysts and Fistulae of the Neck, Ann. Surg. **95**: 1-26 (Jan.) 1932.
4. Meyer, H. W.: True Branchiogenic Cyst and Fistula of the Neck, Arch. Surg. **35**: 766 (Oct.) 1937.

follow (fig. 4). On completion of the dissection, the stump should be inverted into the pharynx when this is possible (fig. 5).

True branchiogenic fistulas do occur, but they are indeed rare and must occur within the realm of the

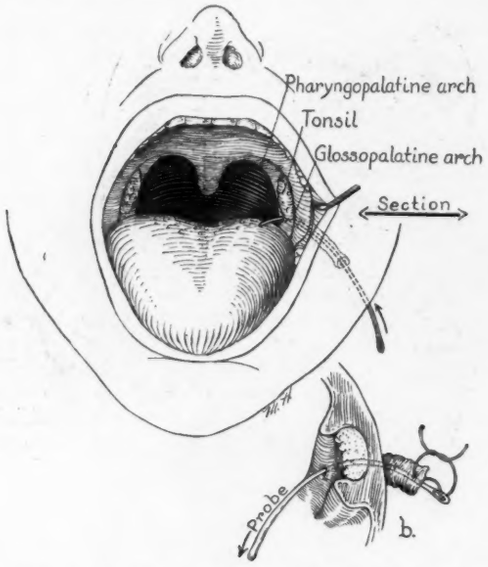


Fig. 5.—Branchial fistula. Tract has been dissected up to arched passage into the pharynx; *b*, method of immersion of stump.

branchial apparatus, which at best is not much lower than the hyoid, and the tract, instead of being lined with squamous epithelium, is lined with vestiges of skin, hair follicles, sweat glands and sebaceous glands.

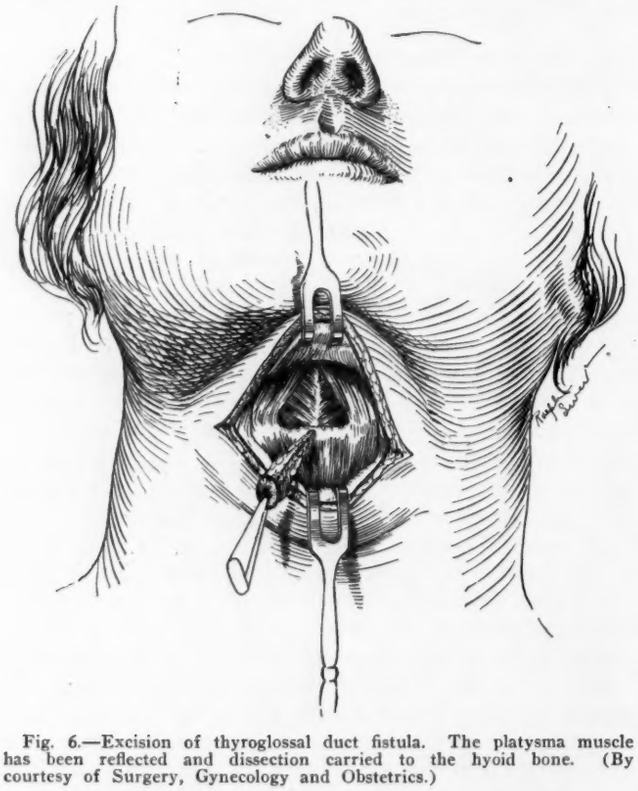


Fig. 6.—Excision of thyroglossal duct fistula. The platysma muscle has been reflected and dissection carried to the hyoid bone. (By courtesy of Surgery, Gynecology and Obstetrics.)

ABERRANT THYROID

Proceeding with the embryologic study, Wenglowski found that from the fourth pouch not only the parathyroids developed but that a comparatively short tubule passed on either side in a somewhat medial direction to form the lateral lobes of the thyroid. Now it is not universally agreed that the thyroid has more than one anlage, but the distribution of aberrant thyroids can certainly be explained on this basis.

LINGUAL THYROID AND THYROGLOSSAL DUCT CYSTS AND FISTULAS

During the third week two rounded buds appear on the ventral side of the first two arches. The anterior bud, the tuberculum impar, forms the anterior part, and the posterior bud, the copula, forms the posterior part of the tongue. From a depression—the foramen caecum—between the two buds a tubule descends to and around the hyoid bone and proceeds downward to be the anlage of the thyroid. This tubule is the thyroglossal duct. Any arrest above the hyoid in its descent will result in the anomalous lingual thyroid, which

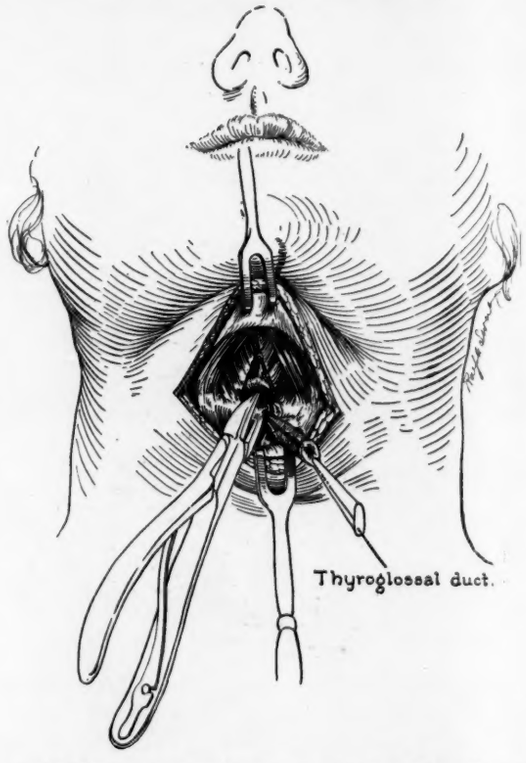


Fig. 7.—Excision of thyroglossal duct fistula. The midportion of the hyoid bone is being removed with bone forceps, according to the method of Sistrunk. (By courtesy of Surgery, Gynecology and Obstetrics.)

Catell and Hoover [5] reported as occurring only twice in 7,600 thyroids operated on at the Lahey Clinic. Normally the duct atrophies, but when it remains patent in any portion a thyroglossal duct cyst or a fistula is the result.

The clinical picture is that of a cyst or fistula, which occurs near the middle of the neck, usually just below the hyoid, and moves up on swallowing. With the fistulous opening there is either a continuous or an intermittent discharge of mucoid material. Troublesome symptoms such as a choking sensation and difficulty in swallowing are rare, but secondary infection is fairly common. All too frequently the cyst is mistaken for an abscess, and consequently a history of repeated incision and drainage without cure is often noted. Adequate surgical approach was first described

5. Catell, R. B., and Hoover, W. B.: Lingual Thyroid Gland: Report of Case and Discussion of Aberrant Thyroid Tissue, S. Clin. North America **9**: 1355-1362 (Dec.) 1929.

by Sistrunk.[6] It consists of a horizontal incision surrounding the fistula or cyst (fig. 6). A central segment of the hyoid is then removed (fig. 7) and, since identity of the duct is usually lost between it and the foramen caecum, a portion of the tongue tissue is cored out between these two points (fig. 8).

SUBMAXILLARY AND SUBMENTAL INCLUSION CYSTS

The submaxillary and submental glands are formed in the alveolar lingual groove directly behind the first arch. They begin as small furrows, the posterior parts of which close over to give rise to a number of buds forming lobules of the gland. Any obliteration of these tubules will produce inclusion cysts, in which case surgical assault consists in removal of the offending gland itself.

CYSTIC HYGROMA

In a recent review[7] of congenital lesions of the neck I reported eleven thyroglossal duct cysts and fistulas and four so-called branchial cysts and fistulas. We had at that time four cases of cystic hygroma. After a thorough study of cystic hygroma, Emil Goetsch[8] came to the conclusion that these probably arise from sequestrations of lymphatic tissue derived from the primitive jugular sacs which failed to join the regular lymphatic system. The tumor is a multilocular tumor (fig. 9) lined with endothelium and containing a clear or straw colored fluid, usually located in the neck near the junction of the internal jugular and subclavian veins. Diagnosis is often as easy as the treatment is difficult. These lesions have invasive properties into any and all surrounding structures, making complete removal usually an absolute impossibility, and this, associated with a high susceptibility to infection, results in a rather high mortality. Figi[9] has recommended irradiation but reports a rather high mortality, and I am inclined to agree with Fleming[10] and Goetsch[8] that as complete an excision as possible is the method of choice, except in large tumors in very young infants, in whom radiation might be attempted. I have seen one patient apparently cured following an infection. In that particular case an infection of a cystic hygroma followed a septic throat which necessitated an attempt to relieve the obstructive dyspnea by surgical intervention. Invasion of tiny cysts into the muscles could be noted everywhere well down into the mediastinum and surgical removal was considered most incomplete, yet after a stormy convalescence there is no evidence of tumor tissue five years later.

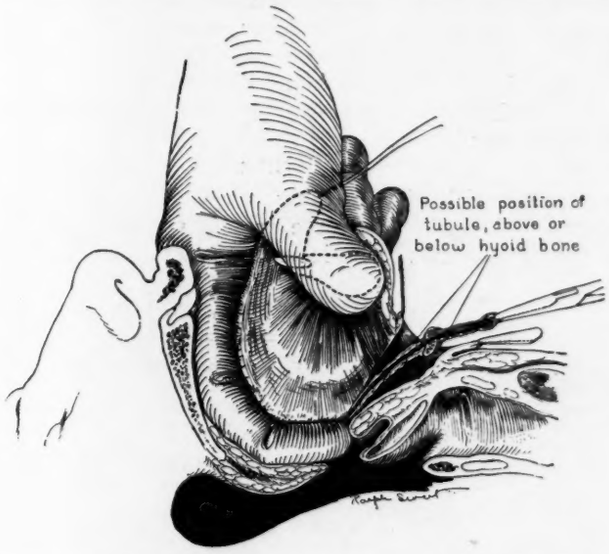


Fig. 8.—Excision of thyroglossal duct fistula. The midportion of the hyoid bone has been removed. From this point the tract is cored out in the direction of the foramen caecum, which is about a 45 degree angle, with the patient in the goiter position. Dissection is carried up to a point at which the finger at the foramen caecum can be identified, according to the method of Sistrunk. (By courtesy of Surgery, Gynecology and Obstetrics.)

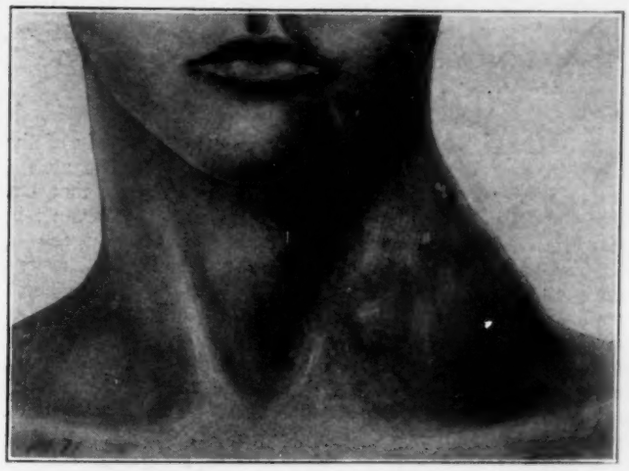


Fig. 9.—Cystic hygroma, showing usual location of the multilocular cystic mass.

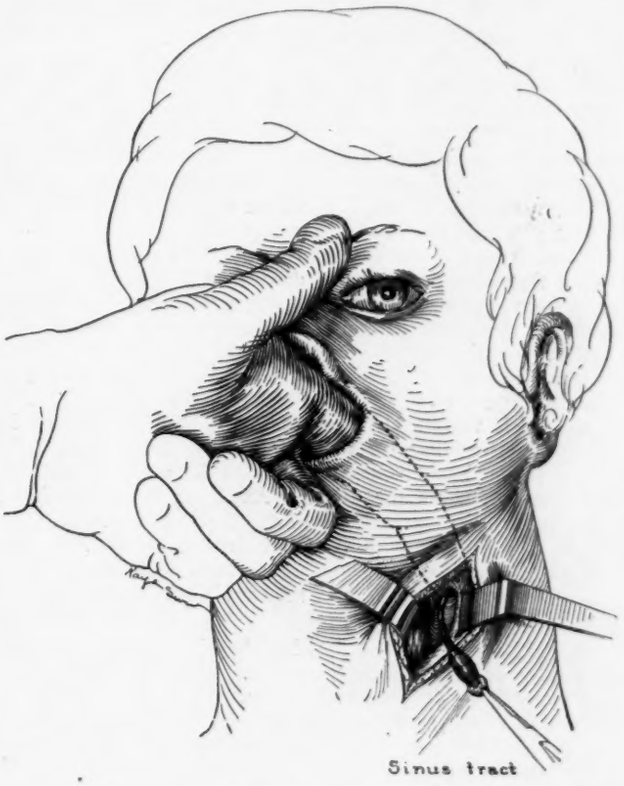


Fig. 10.—Excision of branchial fistula, showing assistant's finger pushing outward in the region of the tonsillar fossa, as dissection is carried to the pharynx. (By courtesy of Surgery, Gynecology and Obstetrics.)

6. Sistrunk, W. E.: Thryoglossal Duct, Ann. Surg. **71**: 121 (Feb.) 1920.

7. Baumgartner, C. J.: Surg., Gynec. & Obst. **54**: 948-955 (May) 1933.

8. Goetsch, Emil: Hygroma Colli Cystic and Hygroma Axillare, Arch. Surg. **36**: 394-479 (March) 1938.

9. Figi, F. A.: Radium in Treatment of Multilocular Lymph Cysts in Children, Am. J. Roentgenol. **21**: 473 (May) 1929.

10. Fleming, Bruce: Cystic Hygroma of Neck, J. A. M. A. **110**: 1899-1900 (June 4) 1938.

CONCLUSION

Surgical assault on any congenital lesion of the neck necessitates at least a fundamental knowledge of the embryologic anatomy of the neck. So-called branchial cysts and fistulas are rare, and what are ordinarily called branchial cysts and fistulas should be termed thymic duct cysts and fistulas.

523 West Sixth Street.

ABSTRACT OF DISCUSSION

DR. HERBERT WILLY MEYER, New York: The study of the embryology of the congenital lesions of the neck has always been a fascinating subject. It is an interesting fact that Dr. Wenglowski, who has probably done more complete work in this investigation than any other author, was a surgeon in Moscow and not an embryologist. His friends, obstetricians and gynecologists, furnished him with seventy-eight embryos ranging in size from 2 to 49 mm. He further performed 144 autopsies on the neck region of infant cadavers and added the study of fifty-nine adult autopsies. Of all of this material he made wax reconstructions and showed the models at the sixth and seventh Russian Surgical Congress. A theory based on such complete and intensive work deserves serious consideration. Wenglowski studied the branchial apparatus and the development of the neck and such organs as the thymus and thyroid glands. He showed that the branchial apparatus is present in the first and second months of fetal life. Its greatest development is at the end of the first month and it completely disappears by the second half of the second month. The pharyngothymic duct develops from the third branchial pouch and passes downward laterally behind the thyroid duct, which develops from the fourth pharyngeal pouch. The two lateral lobes of the thyroid developing from the fourth pouch meet the midthyroid lobe, which descends from the foramen caecum to form the thyroid gland. The two pharyngothymic ducts passed downward and forward to meet behind the sternum to form the thymus gland. Normally these ducts disappear completely. If only portions disappear, lateral cysts of the neck develop. If an external opening forms on the skin and the entire duct persists, a complete lateral fistula of the neck develops, emptying into the pharynx through the tonsillar fossa. In the midline, cysts and fistulas of the neck, developing from the lingual duct and the thyroglossal tract, pass downward to the tongue from the foramen caecum. A complete patent tract never is present but only a strand of thickened tissue arising from lingual duct structures or thyroid gland structures. As the hyoid bone develops, it cuts this thyroglossal tract in half by pressure. Frequently gland structures thereby are present under the periosteum and in the midportion of the hyoid bone. Therefore, in order to cure midline cysts and fistulas of the neck, a midportion of the hyoid bone must always be removed and the tract cored out from the tongue. Any cyst or fistula of the lateral portion of the neck above the level of the hyoid bone may be a true remnant of the branchial apparatus. Any cyst or fistula in the lateral portion of the neck below the level of the hyoid must of necessity be a remnant of the pharyngothymic apparatus.

DR. CONRAD J. BAUMGARTNER, Los Angeles: I wish to thank Dr. Meyer for his excellent discussion. It is frequently impossible, particularly in children, to invert the stump as shown by previous illustration. I have found it helpful in such cases to have an assistant's finger push outward from the tonsillar fossa in the direction of the dissection. As the finger of the assistant is approached, the stump is severed and ligated.

Heredity and Mental Diseases.—When we consider the nature and etiology of the various mental diseases we become aware of the fact that in less than 40 per cent of the patients admitted to mental hospitals do we find evidence for a hereditary basis, namely, in dementia praecox, manic-depressive, mental deficiency with psychosis, and epilepsy. In the remaining 60 per cent of the patients heredity may play a minor role, but the important etiological factors are probably constitutional (exogenous).—Landis, Carney, and Page, James D.: Modern Society and Mental Disease, New York, Farrar & Rinehart, Inc., 1938.

PENTOTHAL SODIUM

IS ITS GROWING POPULARITY JUSTIFIED?

HENRY S. RUTH, M.D.
MERION STATION, PA.
RALPH M. TOVELL, M.D.
HARTFORD, CONN.
ALEXANDER D. MILLIGAN, M.D.
ELMVALE, ONT.
AND
DURANT K. CHARLEROY, M.D.
PHILADELPHIA

The intravenous use of pentothal sodium in anesthesia has shown a definite and consistent increase since it was first offered in 1934. A five year interval is too short a period after which to assume a final attitude on any anesthetic drug or technic. Nevertheless it is a sufficient interval to indicate logically a way station in its history at which to pause for a critical survey. Therefore it is our aim here to "examine the record" of that which has taken place to date. This examination will include a brief consideration of the literature, certain observations concerning the technic of its administration, and the scope of its rational application in our hands.

LITERATURE

An editorial of a leading surgical magazine[1] in March 1939 aptly stated the present position of intravenous anesthesia: "The increasing usefulness of intravenous anesthesia for many types of operations has never been as apparent as it has been recently." This statement may be confirmed further by a perusal of the literature on the subject. More than 100 articles dealing primarily with or touching on the use of pentothal sodium have been published. Medical opinion is found to be predominantly favorable.

TABLE 1.—*Reports of Administration of Pentothal Sodium*

Cameron	225	Kassebohm and Schreiber	125
Horsley	2,000	Jarman and Abel	1,000
Vaizey	1	Murphy	100
Dixon	18	La Breeque	80
Organe and Broad	236	Lundy	8,500
Carraway and Carraway	3,559	Ruth and Tovell	5,500
Total			21,344

In animal experimentation, it has been found that pentothal sodium may produce disturbances of cardiac rhythm.[2] Conflicting evidence to this statement has also been observed, a brief of which may be presented as follows: A large percentage of animals showed no change in the electrocardiogram, while another group showed disturbances in rhythm and conduction which

From the Departments of Anesthesia, Hartford Hospital, Hartford, Conn., and Hahnemann Medical College and Hospital, Philadelphia.

Read before the Section on Miscellaneous Topics, Session on Anesthesia, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Adams, R. Charles: Intravenous Anesthesia, Surg., Gynec. & Obst. **68**: 719-721 (March) 1939.

2. Gruber, Charles M.; Gruber, Charles M., Jr., and Colosi, Nicholas A.: The Irritability of the Cardiac Vagus Nerve as Influenced by the Intravenous Injection of Barbiturates, Thiobarbiturates and Picrotoxin, J. Pharmacol. & Exper. Therap. **63**: 215-228 (July) 1938. Gruber, C. M.: The Effects of Anesthetic Doses of Sodium Thiopentobarbital, Sodium Thio-Ethamyl and Pentothal Sodium on the Respiratory System, the Heart and Blood Pressure in Experimental Animals, ibid. **60**: 143-147 (June) 1937. Gruber, Charles M.; Haury, Victor C., and Gruber, Charles M., Jr.: The Cardiac Arrhythmia, Characteristic Effect of Thiobarbiturates, as Influenced by Changes in Arterial Blood Pressure, ibid. **63**: 193-213 (June) 1938.

were temporary.[3] The effect on the heart of human beings was insignificant.[4] Electrocardiographic tracings were essentially negative.[5] There were no changes or abnormalities in QRS or T waves.[6] No changes in rhythm were recorded when the drug was administered without the occurrence of cyanosis.[7] There was no marked deleterious effect on the myocardium or conductive system of the heart demonstrable by the electrocardiographic record.[8]

Focal necroses have been shown to have occurred in the liver in mice.[9] It is generally conceded that the drug should not be employed in the face of overwhelming hepatic destruction. Only one instance of hepatic disturbance in man was found to be recorded.[10] In that report it was suggested that there was a possibility that the toxic jaundice which developed after the administration of pentothal sodium to this apparently normal individual might have been a coincidental "catarrhal jaundice."

Attention has been called to the occurrence of temporary closure of the glottis and a hyperactive state of the laryngeal reflex, further complicated by frequent coughing. In addition, hiccups or sneezing may occur. It has been suggested that these phenomena are due to parasympathetic overactivity.[11] For this the preanesthetic administration of atropine or scopolamine is shown as an adequate prophylactic measure. One investigation on animals suggests the possibility of cumulative action. In this study[12] a dosage identical with the original was injected whenever the signs of light anesthesia presented. This method of procedure would suggest the possibility of overdose; no anesthetist would administer in clinical practice the amount of any anesthetic agent that was required for the purpose of induction, when, during the period of maintenance, the patient appeared in light anesthesia. There is reported no change in the urinary secretion or in the concentration of blood urea.[13] The blood sugar is reported as being raised somewhat, but not sufficiently to cause any practical difficulty in the control of diabetes.[14] The drug causes an immediate depression of intestinal contraction and tonus. This primary effect was transient and succeeded by a more prolonged phase showing increased intestinal contraction and tonus, which persisted throughout the remainder of the anesthetic period.[15].

The use of pentothal sodium for diagnostic tests and for the control of convulsions due to the employment of toxic drugs and to tetanus and eclampsia appears to be of definite value.

A summation of the number of instances of the administration of pentothal sodium to human beings recorded in the literature is difficult of determination. It would seem that its use has been somewhat retarded,

TABLE 2.—*Variety of Operative Procedures Performed Under Intravenous Pentothal Anesthesia*

Types of Operations	No. of Cases
Dental	
Extraction of teeth	660
Total	660
Gynecology	
Dilation and curettage	487
Conization	53
Radium implantation	35
Posterior vaginal puncture	17
Removal of polyp	23
Examination under anesthesia	15
Incision and drainage of Bartholin glands	15
Dehiscence of hymen	5
Replacement of uterus	8
Miscellaneous	30
Total	688
Surgical	
Incision and drainage	259
Excision	120
Hemorrhoidectomy	13
Suture	26
Biopsy	12
Amputation	17
Débridement	14
Plastic operations	22
Coagulation and cautery	26
Paracentesis abdominalis	9
Removal of packs and redressings	18
Thyroidectomy	10
Miscellaneous	60
Total	606
Urology	
Cystoscopy and x-ray examination	343
Fulguration	86
Dilation	38
Transurethral resection	43
Removal of calculus	26
Incision and drainage	8
Suprapubic cystotomy	10
Internal and external urethrotomy	8
Insertion of suprapubic drain	8
Circumcision	4
Miscellaneous	24
Total	598

Types of Operations	No. of Cases
Eye	
Sclerotomy	7
Enucleation	13
Recession and resection	7
Excision of cataract	9
Discission of cornea	5
Iridectomy	3
Trephine	4
Chalazion	3
Miscellaneous	7
Total	58
Ear, Nose and Throat	
Bronchoscopy	3
Removal of polyp	6
Antrotomy	3
Excision of cancer of antrum	1
Mastoidectomy	1
Paracentesis tympani	5
Reduction of fractured nose	4
Biopsy	1
Total	24
Orthopedics	
Reduction of fractures	87
Manipulation of joints	15
Application of cast	21
Insertion of Steinman pin	10
Arthrotomy	4
Internal fixation of hip	42
Sequestrectomy	4
Tenotomy	7
Miscellaneous	8
Total	198
Neurosurgery	
Encephalogram	81
Ventriculogram	24
Burr openings	5
Removal of bone spur	1
Neurorrhaphy	2
Craniotomy	34
Trephine	1
Total	148
Grand total	2,980

SUMMARY

Dentistry	660	Eye	58
Gynecology	688	Ear, nose and throat	24
Surgery	606	Orthopedics	198
Urology	598	Neurosurgery	148
Grand total	2,980		

initially, by employment of the method of predetermined and nonfractional dosage formerly recommended for the administration of a comparable drug (evipal soluble). This method of dosage placed definite limitations on the use of either drug until such time as the intermittent method of administration was accepted generally. A further difficulty in estimating the number of administrations was presented by the fact that many reports on intravenous pentothal sodium included, in the statistical portions, an unstated number of patients anesthetized by evipal soluble. Nevertheless, 21,344 instances in which pentothal sodium was administered

3. Kohn, Richard, and Lederer, Ludwig: Pentothal Studies with Special Reference to the Electrocardiogram, J. Lab. & Clin. Med. **23:** 717-718 (April) 1938.

4. Jarman, Ronald: The Combination of Intravenous with Spinal Anesthesia, Using Pentothal and Percaine, Brit. J. Anesth. **15:** 20-24 (Oct.) 1937.

5. Carraway, B. M., and Carraway, C. N.: Intravenous Anesthesia: A Clinical Study of Nineteen Hundred Cases, Am. J. Surg. **39:** 576-580 (March) 1938.

6. Volpitto, P. P., and Marangoni, B. A.: Electrocardiographic Studies During Anesthesia with Intravenous Barbiturates, J. Lab. & Clin. Med. **23:** 575-581 (March) 1938.

7. Betlach, C. J.: The Effects of Pentothal Sodium on the Electrocardiogram of Patients with Essential Hypertension, Proc. Staff Meet., Mayo Clin. **13:** 189-191 (March 23) 1938.

8. Thomas, George: Clinical and Laboratory Observations on Intravenous Anesthesia, Anesth. & Analg. **17:** 163-168 (May-June) 1938.

9. Reynolds, Chapman; Schenken, John R., and Veal, J. Ross: Pathological Findings in Mice After Pentothal Narcosis, Anesth. & Analg. **17:** 357-359 (Nov.-Dec.) 1938.

10. Vaizey, J. M.: Toxic Jaundice Following Administration of Pentothal, Brit. J. Anesth. **15:** 55 (Jan.) 1938.

11. Burstein, Charles L., and Rovenstine, E. A.: Respiratory Parasympathetic Action of Some Shorter Acting Barbituric Acid Derivatives, J. Pharmacol. & Exper. Therap. **63:** 42-50 (May) 1938.

12. Veal, J. R., and Reynolds, Chapman: The Cumulative Effects of Pentothal Sodium, South. M. J. **31:** 649 (June) 1938.

13. Tovell, Ralph M., and Thompson, Gershom J.: Pentothal Sodium Anesthesia in Urologic Practice, J. Urol. **36:** 81-87 (July) 1936.

14. Betlach, C. J., and Tovell, R. M.: Blood Sugar and Blood Urea Determinations Before and After Anesthesia with Pentothal Sodium, unpublished data quoted by Lundy, John S.: Intravenous Anesthesia, Am. J. Surg. **34:** 559-570 (Dec.) 1936.

15. Burstein, C. L.: Effect of Some Short-Acting Barbituric Acid Derivatives on Intestinal Activity in Vivo, Proc. Soc. Exper. Biol. & Med. **40:** 122-124 (Jan.) 1939.

intravenously to human beings were located (table 1). Of this group 2,980 are reported in detail in tables 2 and 3.

ADMINISTRATION

The preparation of the patient, the chemical and pharmacologic effects and the preparation and method of administration of pentothal sodium have been heretofore adequately described.[16] These aspects will not be repeated at this time. Certain factors concerning its administration will be emphasized, however, and additional observations presented at this time.

TABLE 3.—*Additional Statistics from Hartford Hospital Series*

	Number	Duration	Minutes
Females	1,277	Shortest	2
Males	723	Average	15.9
	2,000	Longest	80
	Years	Dosage	5% Solution
Youngest	9	Smallest	2.0 cc.
Oldest	90	Average	10.5 cc.
		Largest	40.0 cc.
Results		Repeated Administrations	No. Cases
Satisfactory	1,936	8 times	1
Not satisfactory	64	6 times	2
Cyanosis	34	5 times	2
Spasm	2	4 times	5
Rigidity	4	3 times	13
Postoperative vomiting	2	2 times	72
Pallor	3		
Excitement	2	Multiple administrations	95
Hiccup	2		
Miscellaneous	15		

Prior to the publication of the pharmacologic and physiologic explanation of the value of the administration of atropine or scopolamine before pentothal sodium had been given, it was our practice to administer these drugs preoperatively. They not only effectively counteract the parasympathetic overactivity of this drug but minimize the likelihood of production of excessive secretions. Morphine is prescribed in many instances together with the atropine or scopolamine but always in decreased dosages as compared to those prescribed before inhalation anesthesia. (We regard morphine sulfate one-eighth to one-sixth grain [0.0081 to 0.0108 Gm.] as the maximal dose.) In the aged and debilitated, even though morphine is not administered, and in every instance in which their use is possible, either atropine or scopolamine is administered.

Caution regarding the speed of injection cannot be overemphasized. The patient to whom pentothal sodium is being administered has no active mechanism of defense as, for example, is initiated by the irritating action of ether. The facility with which patients may be anesthetized has proved an ever present temptation to make the induction even more startling by the too rapid administration of the drug. A sacrifice of time will increase the factor of safety. It has been our practice recently either to consume from one to two minutes or more for the induction of anesthesia rather than from twenty to thirty seconds, or at least to pause after the injection of 2 cc. of a 5 per cent solution to estimate the depth of anesthesia produced. Recently a 2.5 per cent solution, instead of the usual 5 per cent solution, has been employed with satisfactory results.[17] This solution further facilitates a slow injection and appears to remove the possibility of the rare occurrence of phlebitis.

It should be emphasized that respiratory depression occurs readily following too rapid administration. No difficulty should be encountered if the administration is continued to the point of anesthetic saturation of the tissues of the central nervous system at a rate sufficiently slow to avoid depressive concentrations being carried to the respiratory center. Experience in its administration is the predominant factor in the problem of timing the rate of injection. It appears that it is a mean between a rapid injection, which quickly depresses the respiratory center, and an injection which is sufficiently retarded so that time is allowed for the drug's detoxification before anesthetic concentrations are produced. The function of respiration must be further protected by diligent maintenance of a patent respiratory tract. Relaxation of the soft tissues about the upper respiratory tract is apt to occur and thereby impinge on its patency. At the same time, obtundation of both pharyngeal and laryngeal reflexes does not occur until quite profound anesthesia has become established. Therefore, when an adequate airway cannot be maintained by proper position of the head, insertion of a nasopharyngeal airway rather than a pharyngeal airway should immediately be carried out. At times, if there is an interference with the efficiency of the respiratory tract, recourse should be had to the usual methods for its rectification which are employed during inhalation anesthesia, which include endotracheal intubation. Cyanosis should never be tolerated by the anesthetist. A source of oxygen under low pressure sufficient to inflate the lungs should be constantly available during the administration of pentothal sodium.

CONTRAINDICATIONS

The contraindications noted elsewhere[18] are recognized by us. The drug is not employed when there is a marked physiologic or mechanical interference with respiratory function. At the present time the drug is employed rarely for patients under 15 years of age and seldom below 10 years of age. The presence of cardiac dysfunction to the point of dyspnea is recognized as a contraindication. Varicosity central to the point of injection serves as a contraindication or a possibility of slow entrance of the drug into the general circulation after injection is duly noted. Manipulations disturbing pharyngeal and laryngeal reflexes preclude the advisability of employment of this drug, unless other indications for it are real and adequate. In such a

TABLE 4.—*Average Effect of Administration of Pentothal Sodium on Blood Chemistry of Twenty-Five Unselected Patients*

	Before	After	1 Day After
Dextrose, mg	97	109	99
Urea, mg	15	17	18
Creatinine, mg	1.4	1.3	1.3
Uric acid, mg	3.3	3.3	4.0
Cholesterol	193	195	189
Carbon dioxide	49.1	49.7	49.7
Icterus index	6.8	7.9	6.3
Hemoglobin, Gm.	12.9	12.6	12.9
Red blood cells, millions	4.5	4.3	4.4
White blood cells, thousands	8.5	8.0	8.8
Bleeding time, minutes	1.2	1.1	1.1
Venous coagulation, minutes	11.0	12.8	11.3
Differential count			
Polymorphonuclears	73.5	73.1	76.5
Lymphocytes	23.0	23.7	19.8
Mononuclears	3.2	3.1	3.2
Eosinophils	0.4	0.1	0.2
Basophils	0.1		

16. Wilcox, Frederick C., and Tovell, Ralph M.: Anesthesia in Relation to Diabetes, Anesth. & Analg. **18:** 94-101 (March-April) 1939.

17. Lundy, John S.; Tuohy, E. B.; Adams, R. Charles, and Mousel, L. H., to be published.

18. Garofalo, Mario: The Present Status of Pentothal Sodium as an Anesthetic Agent, J. Connecticut M. Soc. **2:** 550-557 (Nov.) 1938.

condition, preliminary topical anesthesia of the affected mucous membrane is to be established. A definite deviation from normal in the oxygen-carrying capacity of the blood indicates caution in its application, as for example in the presence of severe anemias. It would not seem wise to employ it in the face of gross hepatic damage, although we found in one instance that the icterus index and bromsulphalein test were unaffected by a forty-minute administration for an intra-abdominal visualization in the presence of massive cancer of the liver.

UNDESIRABLE EFFECTS AND THEIR MANAGEMENT

Sloughing of tissue and irritation at the site of injection may be prevented by the injection of a 2.5 per cent instead of a 5.0 per cent solution. Respiratory depression is rarely a problem with careful and experienced administration but, when present, is best managed by inhalation or inflation of oxygen. Muscular tremors may be annoying, but slow administration usually overcomes them. If not, resort should be made to another agent. Postanesthetic headaches are rare. The fall in blood pressure is minimal. Postanesthetic nausea and vomiting are also rare.

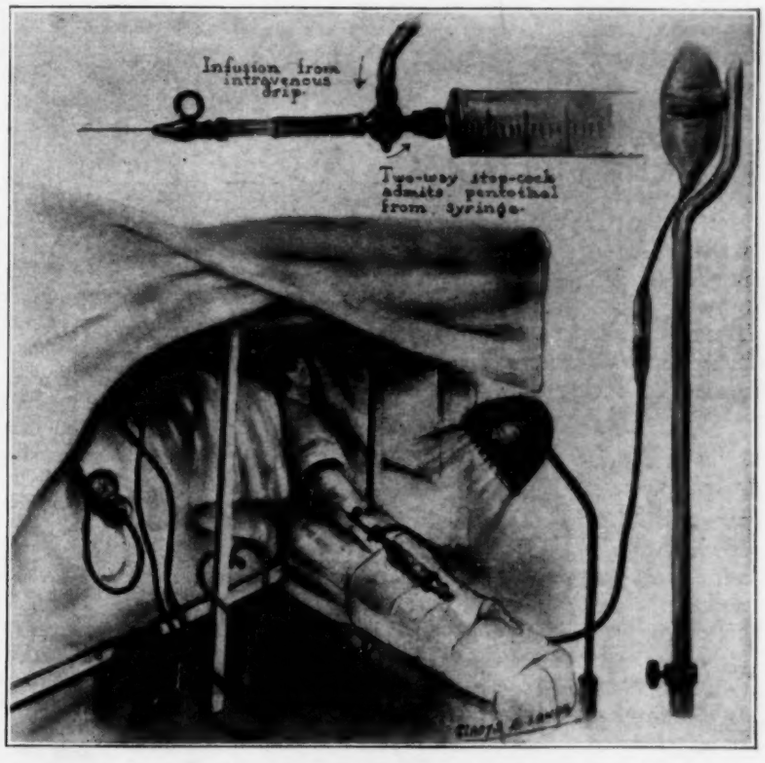
APPLICATION

We feel that pentothal sodium is a valuable drug for operations of short or moderate duration, when extensive muscular relaxation, particularly abdominal, is not required and when there is no interference with respiratory function and laryngeal or pharyngeal reflexes. Its use in our hands is adequately shown in tables 2 and 3.

In addition, we would call attention to its value in our hands in certain supplementary capacities. The first of these is indicated during the operative period under regional or spinal anesthesia, when such is prolonged. Here occasionally the patient may become somewhat uncomfortable as the result of the operative position. This condition is further complicated by a progressive diminution in the effects of the preanesthetic sedation. Here we have found it quite advantageous to administer intermittently minimal amounts, just short of the establishment of unconsciousness. By this means the patient is rendered relaxed and calm and there is a reestablishment of the effects of the original preanesthetic sedation.

Anesthetists are rarely called on today to anesthetize patients suffering from toxic hyperthyroidism who have not been controlled medically before operation. Nevertheless, instances occasionally occur in which preoperative treatment in this condition is of decreased value and it becomes essential to anesthetize these patients with a minimum of preanesthetic disturbance. In such a situation it has been our custom to visit the patient in his room and to state that a blood test is to be performed. After venous puncture, the unsuspecting patient is put to sleep with just sufficient pentothal sodium to enable his removal to the cart. Anesthesia is then continued by inhalation methods. By such means we have been able to remove the patient to the operating room and have the operation started without any evidence of increase in the toxic manifestations of the patient's disease. Pentobarbital sodium may be used as an alternative agent for this purpose. From 3 to 4½ grains (0.2 to 0.3 Gm.) administered intravenously will usually suffice.[19]

The results in thirty-four major intracranial procedures were gratifying. Its application in this respect was initiated by a report that intracranial pressure is not raised by its use [20] and by the freedom from hazard of fire and explosion that is provided. Infiltration anesthesia is performed, and pentothal sodium is administered only when the patient becomes tired or restless. Initially, it is injected in similar fashion as described for prolonged operations under regional anesthesia. In several instances it was not necessary at any time to produce complete unconsciousness. This method appeals to us because of its greater controllability as compared to rectal instillations of other agents. The simple apparatus for this purpose is shown in the accompanying illustration. The continuous intravenous drip flows between administrations of pentothal sodium at any desired speed and prevents clotting in the needle. The operating time varied up to five hours and fifteen minutes, with an average time of two hours and forty minutes. The largest single dose was 3.15 Gm., with an average dose of 0.95 Gm. From both surgical and anesthetic points of view we see reason to continue its use in such manner for major intracranial surgery but should state that this portion of the series is too small to be conclusive. It should also be emphasized that its application in this respect was managed only by a highly organized group.



Apparatus for continuous intravenous drip between administrations of pentothal sodium.

ELECTROCARDIOGRAPHIC AND BLOOD STUDIES

An investigation into possible blood changes was carried out by having tests, the results of which are shown in table 4, performed on the day of, but before

19. Adams, R. Charles: Personal communication to the authors.
20. Horsley, J. S.: The Intracranial Pressure During Barbital Narcosis, Lancet **1**: 141-143 (Jan. 16) 1937.

the administration of, pentothal, immediately following the conclusion of the operation, and in the morning of the first day following its administration. These were completed on twenty-five consecutive unselected patients.[21] A slight but evidently insignificant rise in the content of dextrose in the blood may be noted immediately following the anesthesia, with a decrease to the preoperative level the next day. Five patients, however, showed a slight immediate decrease. The apparent average rise in blood urea was, to a large extent, accounted for by one patient who exhibited an abnormally high preoperative reading with subsequent additional rise. No changes of any significance were shown in the remainder of the tests performed.

The control of the level of blood sugar is easier than is the control of vomiting which may occur after the administration of other anesthetic agents by inhalation. Since vomiting may lead to the establishment of a diabetic acidosis, it is important to be able to control this untoward reaction by employing pentothal sodium. Patients over 40 years of age may have an associated diabetes and marked cardiovascular disease. It is to members of this group that pentothal sodium must be given with extreme caution.[22]

Starr [23] reports that the electrocardiograms taken before, during and after pentothal sodium anesthesia at Hartford Hospital have been examined by him. He states that all the grams were normal and remained normal throughout the experiments. The rates showed only slight change. The PR intervals were not affected. The amplitude, contour and direction of the QRS complexes and T waves showed only slight, inconsequential variations during the test.

SUMMARY

The contraindications to the administration of pentothal sodium are specific. Patients should be carefully selected. Special care should be taken to maintain an efficient airway and one should always be prepared to administer oxygen by inhalation or by insufflation if necessary. The maximal dose of 1 Gm. needs seldom be exceeded. This potent drug should be administered by an anesthetist competent to control all situations that are likely to occur during the administration of any general anesthetic agent. The drug has produced satisfactory results in our hands. No postoperative pulmonary complications were encountered and no operative fatalities occurred. In view of its apparent effectiveness and safety, its growing popularity is warranted and further exploration for possible application among the groups of patients now receiving inflammable anesthetic agents by inhalation seems justified.

ABSTRACT OF DISCUSSION

DR. GEORGE J. THOMAS, Pittsburgh: My experience with pentothal sodium has been very satisfactory, especially the results of electrocardiographic study. At first an electrocardiographic study was made of patients receiving pentothal sodium and carried in the upper surgical plane of anesthesia. The result of these cases showed no change on the myocardium or the conductive system of the heart. Being encouraged by these results I proceeded to study this agent under unusual conditions. For subjects my associates and I took patients with normal electrocardiograms and gave them a large dose of pentothal sodium. Electrocardiographic study while under this toxic dose showed no change. Five days later electrocardiographic study of the patients showed no latent after-effects. A patient was admitted to the hospital for an operation. He had a coronary attack two years prior to admission. An electrocardiogram showed evidence of bundle branch block due to infarction in the ventricular septum. Numerous premature beats were present. During and after anesthesia, tracings showed no deleterious effect. In fact, following anesthesia the rhythm became regular and the premature beats disappeared. Therefore I feel that the more serious a cardiac condition in a case in which operation is necessary, the more indication there is for pentothal sodium. Preanesthetic medication is an important procedure for a satisfactory intravenous narcosis. I would emphasize the use of the opiates, atropine or scopolamine. We have used pentothal sodium to stop the annoying convulsions that occur under ether anesthesia. As a rule, 2 cc. of 5 per cent solution will stop these convulsions in children. We have used pentothal sodium from five minutes to three hours and fifteen minutes, from 5 years to 85 years of age, from 3 to 69 grains (0.2 to 4 Gm.) in a series of 3,100 cases in the past two and one-half years. We have had no pulmonary complications or death attributed to this type of anesthetic. I agree with the authors regarding the intermittent technic. At St. Francis Hospital we have made this possible and convenient by means of a simple apparatus. For short operations we use the single syringe and a three way stopcock. When the solution in the syringe is depleted we are able to refill the syringe by means of this stopcock. In operations consuming longer than twenty-five or thirty minutes the cannula of the needle frequently becomes clogged with blood clot. Because of this complication we use a manifold to which we attach an ordinary intravenous needle. This makes it possible for us to administer salt solution and pentothal sodium through the same needle.

DR. RALPH KNIGHT, Minneapolis: I quite agree about the danger of muscular spasms of the pharynx and larynx during pentothal anesthesia. At the University of Minnesota we have a good many cases of malignant disease in the region of the mouth and throat. The surgeons constantly asked for pentothal anesthesia for biopsy and often even for destruction of the lesions. Gas anesthesia was impracticable, the contemplated procedure usually seemed too minor to warrant ether anesthesia, and cautery destruction was usually planned. Under pentothal anesthesia, even in the second or third plane of the third stage, in many cases severe spasms of the tongue, pharynx and larynx occurred as soon as the surgical procedure was started, causing respiratory obstruction. Under pentothal sodium, respiratory effort ceases promptly after the occurrence of obstruction. Resuscitative measures were too frequently called for and were sometimes difficult. Often too the surgery proved to be more major than anticipated and it became still more of a problem to maintain an open airway and satisfactory anesthesia. To obviate these difficulties I attempted transnasal blind intubation of the trachea and was surprised to find that it was not difficult under pentothal anesthesia. For a case of carcinoma of the nose I attempted transoral intubation and found it not difficult although it required much deeper pentothal anesthesia than the transnasal method. The first injection of the pentothal sodium must be more rapid than usual to obtain quick throat relaxation; then the injection must be continued, entirely under the direction of the one who is inserting the tube, until the arytenoids and cords relax and the tube can be inserted. This takes not over two minutes as compared with ten to fifteen minutes with gas and ether. As soon as the tube enters the trachea, respiration is usually stimulated. One has complete control, and even should respiration be somewhat overdepressed a few ventilations with oxygen from the machine will restore it to normal. Pentothal sodium with intratracheal oxygen proved to be the ideal anesthetic for these head cases and with this experience we adopted pentothal induction as the routine for introduction of intratracheal tubes whenever they are indicated for any type of surgery, regardless of the anesthetic selected for maintenance. We have now inserted almost 150 intratracheal tubes under pentothal anesthesia.

21. From the Clinical Laboratories of the Hahnemann Medical College and Hospital.

22. Patterson, Robert L.: Case Reports of Fatalities Following Intravenous Anesthesia, Proc. Am. Soc. Anesth., Inc., Feb. 10, 1939. Wilcox.[16]

23. Starr, Robert S.: Personal communication to the authors.

CLINICAL EXPERIMENTS WITH ANDROGENS

IV. A METHOD OF IMPLANTATION OF CRYSTALLINE TESTOSTERONE

SAMUEL A. VEST, M.D.
CHARLOTTESVILLE, VA.
AND
JOHN E. HOWARD, M.D.
BALTIMORE

From experimental observations it is well known that androgenic substances are chemically changed and excreted after entering the circulation. The effectiveness of any androgenic preparation depends on many factors. One of the most important, besides the frequency of administration and the dosage, is the method of administration. The use of various solvents, the addition of fatty acids to the androgenic solutions, esterification of the substances and many other variations have been studied in an attempt to increase the efficiency of administration of androgenic substances. The fact that pure crystalline testosterone is readily absorbed by the body fluids undoubtedly leads to waste when excess material is given. In order to overcome this difficulty and to decrease the rate of absorption, testosterone has usually been injected in an oily solution as the propionate. Injection of testosterone propionate has proved far more effective than the equivalent amounts of free testosterone. The intensity and duration of the action of testosterone has been thus enhanced, and treatment of hypogonadism in human beings has been satisfactorily carried out with injections at intervals of from three to four days.[1] From the results of animal experiments it would appear that when large amounts of testosterone propionate are injected at such intervals an appreciable proportion of the substance is wasted. Testosterone has also been used clinically in the form of inunctions and by oral administration. It is not entirely satisfactory in the form of innunctions and when given by mouth enormous amounts are necessary to elicit clinical response. A method of administration which would tend to simulate the secretion of this hormone by the testis has been sought. If androgenic substance can be administered so that the amount absorbed daily is not in excess of the physiologic requirements, waste will be eliminated and expense can be kept to a minimum. Before the prevalent intramuscular injection of the testosterone propionate in an oily solution is supplanted, a new method must prove to be more convenient, more efficient, less expensive and devoid of harmful consequences.

The first use of pure androgens and estrogens by subcutaneous implantation of crystals or pellets was reported by Deanesly and Parkes [2] in 1937 and 1938. Their work indicated that tablets of compressed crystals implanted subcutaneously produced stronger and longer effects of stimulation than similar doses given by injection. Schoeller and Gehrke [3] later showed the superior effect of implanted testosterone and testosterone propionate tablets in fowls. Having knowledge at the time of the work that Deanesly was carrying out in experimental animals, we first implanted pellets of crystalline testosterone subcutaneously into a patient with hypogonadism in the fall of 1937, but these pellets were too small to produce any significant clinical results. Three recent reports [4] have referred to the implantation of small pellets of testosterone in human beings with questionable results. In the fall of 1938, soon after Thorn [5] began his work with the implanta-

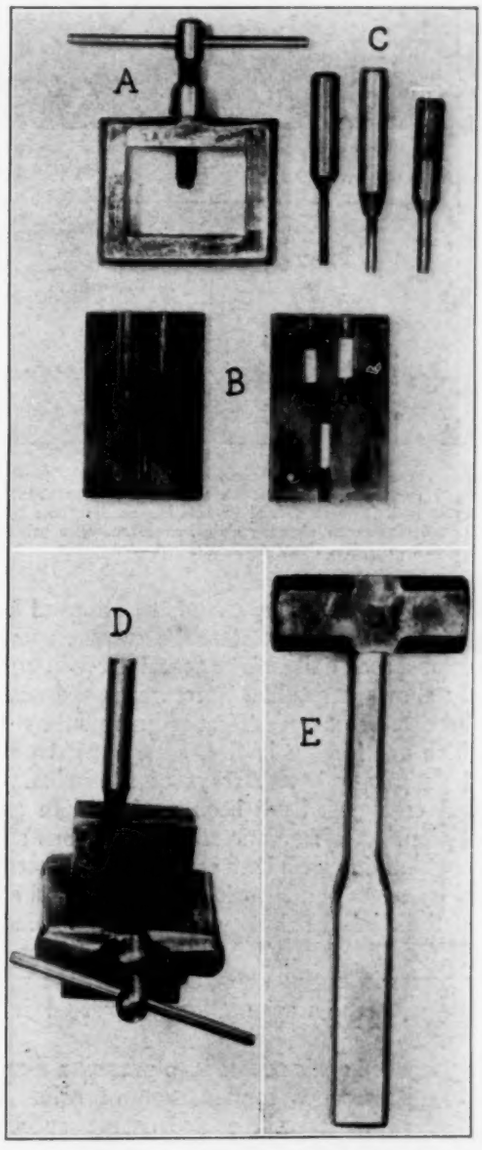


Fig. 1.—The instruments used to make pellets of various sizes. *A*, the press; *B*, the die with three sizes of pellets; *C*, the punches; *D*, the assembled press with a punch in place; *E*, the heavy metal mallet.

From the James Buchanan Brady Urological Institute and the Department of Medicine of the Johns Hopkins University and Hospital.

This work has been aided by a grant from the Ciba Pharmaceutical Products, Inc., which also supplied the testosterone, and by a fellowship from the Lalor Foundation.

This method was presented in brief in a discussion before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Vest, S. A., and Howard, J. E.: Clinical Experiments with the Use of Male Sex Hormones: Use of Testosterone Propionate in Hypogonadism, J. Urol. **40:** 154-183 (July) 1938. Howard and Vest.[6]

2. Deanesly, Ruth, and Parkes, A. S.: Factors Influencing Effectiveness of Administered Hormones, Proc. Roy. Soc., London, s. B **124:** 279-298 (Dec. 7) 1937; Biological Properties of Some New Derivatives of Testosterone, Biochem. J. **31:** 1161-1164 (July) 1937; Further Experiments on Administration of Hormones by Subcutaneous Implantation of Tablets, Lancet **2:** 606-608 (Sept. 10) 1938. Deanesly, Ruth: Use of Castrated Mice for Testing Androgenic Substances, Quart. J. Pharm. & Pharmacol. **11:** 79-83 (Jan.-March) 1938.

3. Schoeller, W., and Gehrke, M.: Tierphysiologische Versuche über die Wirkung männlicher Keimdrüsenhormone: Versuche an Kapaunen, Klin. Wchnschr. **17:** 694-699 (May 14) 1938.

4. Lippross, O.: Ergebnisse der Behandlung männlicher Keimdrüsenhormonen, München. med. Wchnschr. **85:** 1668-1672 (Oct. 28) 1938. Foss, G. L.: Clinical Administration of Androgens: Comparison of Various Methods, Lancet **1:** 502-504 (March 4) 1939. Hamilton, J. B., and Dorfman, R. I.: Influence of the Vehicle upon the Length and Strength of the Action of Male Hormone Substance Testosterone Propionate, Endocrinology **24:** 711-719 (May) 1939.

5. Thorn, G. W.; Engel, L. L., and Eisenberg, Harry: Treatment of Adrenal Insufficiency by Means of Subcutaneous Implants of Pellets of Desoxy-Corticosterone Acetate (A Synthetic Adrenal Cortical Hormone), Bull. Johns Hopkins Hosp. **64:** 155 (March) 1939.

tion of moderate sized pellets of desoxycorticosterone acetate, we began to make and implant pure testosterone in large pellets weighing up to 800 mg. We have now implanted these pellets into a series of thirteen patients with hypogonadism.[6] We have implanted pellets subcutaneously or intramuscularly in the leg, arm, back

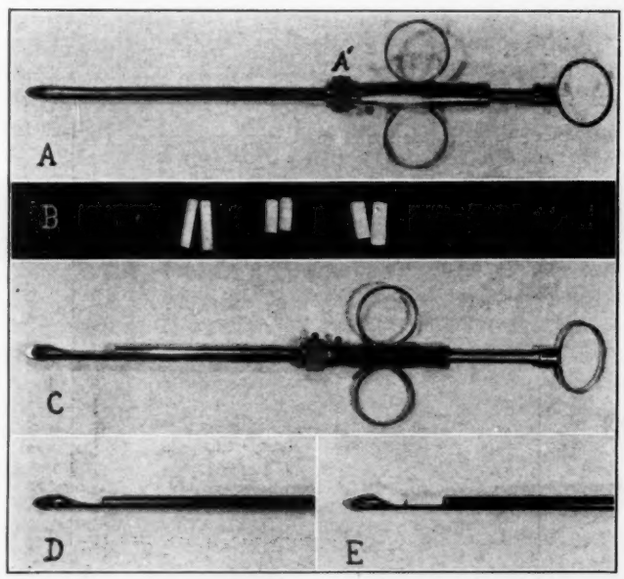


Fig. 2.—*A*, the "injector" instrument with fenestra closed; *A'*, the mechanism to open and close fenestra at will; *B*, three sizes of pellets; *C*, instrument with fenestra opened by rotating handle (note the bladelike point); *D*, end of injector showing obdurator extruding a pellet; *E*, same as *D* but with two pellets being extruded.

and scrotum. The pellets have been removed later and reweighed in order to calculate the average amount that has been absorbed daily. The actual curve of absorption probably shows a gradual decrease as the size of the pellet becomes smaller. Tissues surrounding the pellets, which are foreign bodies, have been removed and studied pathologically. Assays of the urinary androgens and estrogens have been made before and after implantation. A systematic study of various aspects of pellet implantation with both crystalline testosterone and some of its esters is now being completed and an evaluation of the clinical results will be discussed in a forthcoming report.[7] A study of the effects of testosterone and its esters in the monkey, comparing the method of injection with the implantation of pellets, is also in progress.[8]

Our purpose in this report is to present a new technic for the subcutaneous implantation of solids such as pellets of pure crystalline androgenic substance by the use of an "injector" instrument.[9]

If the slow absorption of subcutaneous androgenic substance in pellet form was to be more efficient per unit weight of material utilized, this advantage would be offset somewhat by the impracticability of the necessary incision for implantation. To obviate an operating room procedure, the following method was devised. Figure 1 *A*, *B* and *C* shows the press, die and punches used to make pellets of three different sizes. The pellets are shown in their corresponding slots. Figure 1 *D* shows the assembled press with a punch in place. Figure 1 *E* shows the heavy metal hammer used to pound the previously sterilized, powdered testosterone into a very hard and compact pellet. These implements can be boiled and the pellets are made under sterile technic. It has been impossible to make pellets of uniform size and weight with such an apparatus, but for practical purposes it has served for our study. Many factors probably affect the absorption rate, the foremost of which are the surface area and the density of the pellet. Other possible factors are the vascularity of the site of implantation, the extent of the reaction to the foreign body and the degree of hormone deficiency. For absolute comparative values regarding absorption and clinical effect in a series of cases it would have been ideal to implant pellets of identical size and weight, but this was not possible.

Figure 2 *A* shows one of several instruments which we have devised on the principle of the syringe in order that solid pellets might be injected subcutaneously or intramuscularly in the office instead of in an operating room. It shows the instrument with the fenestra closed and the obturator slightly withdrawn. A scalpel-like point serves to pierce the skin, leaving a clean linear opening. Figure 2 *B* shows pellets of different caliber for which three sizes of instruments can be used, depending on the amount of material one desires to inject. The maximum amount injected with such

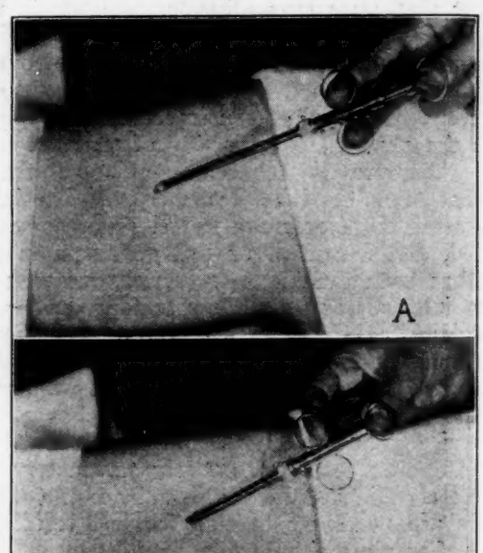


Fig. 3.—Method of depositing pellet by means of a new "injector" instrument. *A*, instrument entering skin of leg through a wheal of local anesthetic; *B*, end of instrument below fascia lata with obturator being pushed forward to extrude and deposit pellet (the fenestra has been opened by rotating window); *C*, skin clip to close puncture wound.

6. Howard, J. E., and Vest, S. A.: Clinical Experiments with the Use of Male Sex Hormones, Am. J. M. Sc., to be published.
7. Howard, J. E., and Vest, S. A., to be published.
8. Vest, S. A.; Drew, Edwin, and Howard, J. E., to be published.
9. This instrument was developed with the assistance of Mr. Frederick C. Wappler, of the American Cystoscope Makers, Inc.

an instrument to date is two pellets of more than 400 mg. each at one time. Figure 2 *C* shows the instrument with the fenestra open and the obturator withdrawn. Figure 2 *D* shows the end of the "injector" or "implanter" with the fenestra open through which the obturator is extruding a pellet. Figure 2 *E* shows how

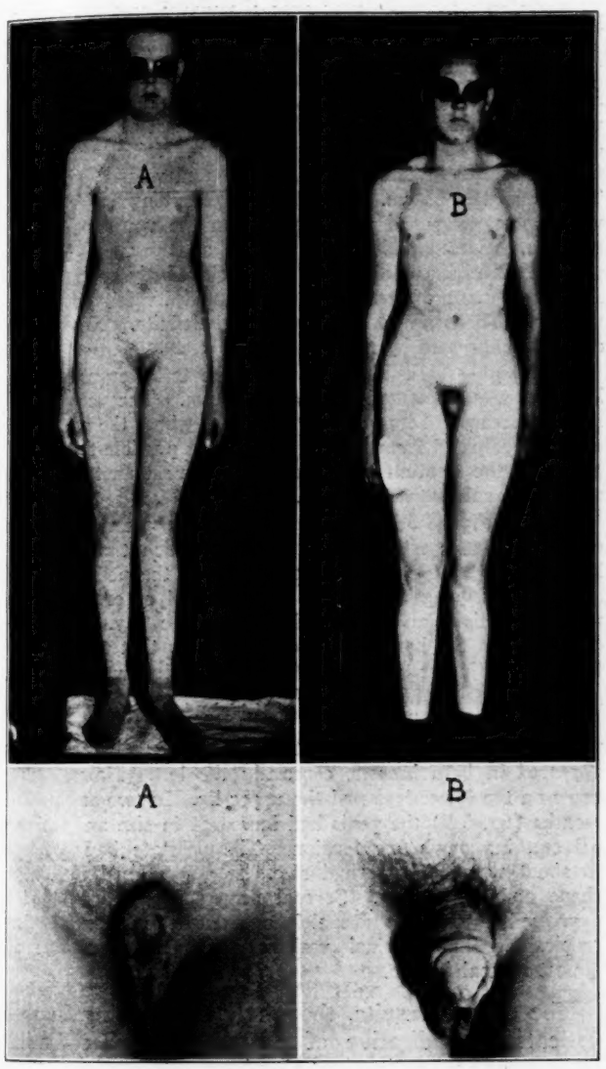


Fig. 4 (case 1).—Appearance of patient, aged 21, with hypogonadism before and after implantation of pellets of crystalline testosterone in muscle of back. *A*, full view and genitalia before implantation; *B*, same ninety days later.

two pellets can be injected, one following the other. The obturator can be entirely withdrawn and the pellets inserted into the proximal end of the barrel as desired instead of through the open fenestra. The fenestra can be opened and closed at will by means of the rotary barrel mechanism controlled at the handle.

The instrument is used in the following manner, as shown in figure 3. A wheal is made in the skin of the thigh with a solution of nupercaine. The instrument with the pellets of testosterone inside and the fenestra closed is pushed painlessly through the skin and, if desired, beneath the fascia lata (fig. 3 *A*). In figure 3 *B* the fenestra has been opened and the obturator is being pushed forward to extrude the pellets in the muscle of the thigh. The fenestra is then closed and the instrument is withdrawn, leaving the pellet in place as shown in fig. 3 *C*. A silver clip has been used to close the puncture wound. A clip is not always necessary because the margins of the skin of the 6 to 8 mm. puncture wound usually approximate themselves.

The following two cases are reported as examples of the clinical activity of testosterone when it is implanted into man in the form of pure crystalline pellets of large size:

CASE 1.—*History.*—W. A., a white youth aged 21, admitted to the James Buchanan Brady Urological Institute March 21, 1939, complained of having "never matured sexually." His two brothers developed normally. The usual changes of puberty, with the exception of the appearance of a few pubic hairs at the age of 15 to 16, did not occur in the patient. He stopped school in the eleventh grade because of his underdevelopment. His psychologic content was definitely male. Erections had occurred frequently in the mornings since the age of 17, and he masturbated several times a year but without ejaculation.

Examination.—Figure 4 *A* shows the typical eunuchoid appearance. The patient was 5 feet 10½ inches (149 cm.) tall and weighed 142¾ pounds (64.8 Kg.). Roentgenograms showed a normal skull and sella, but there was retardation in the epiphysial closure of the bones. There was more than 25 but less than 50 rat units of follicle stimulating factor per liter of

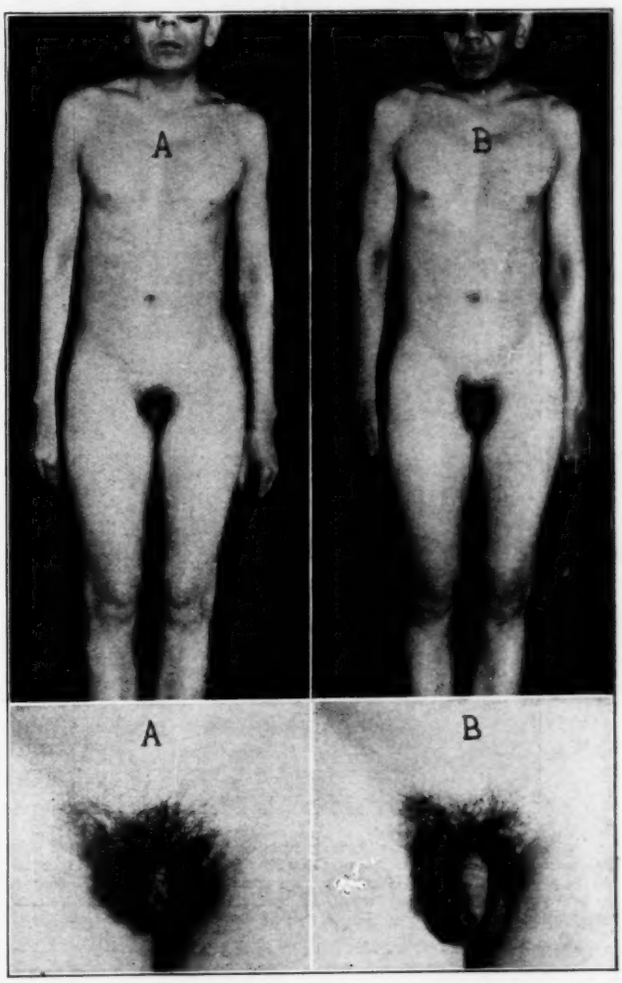


Fig. 5 (case 2).—Appearance of patient, aged 34, with hypogonadism before and after implantation of large pellet of testosterone weighing 750 mg. into scrotum. In some respects this could be termed a "synthetic testicle." *A*, full view and genitalia before implantation; *B*, same two and one-half months later. Slower absorption of large pellet in scrotum was taking place as compared to case 1.

urine. No hair was present on the face, extremities, abdomen or chest. The breasts were normal. The voice was high pitched. The penis was infantile (fig. 4 *A*) and only 5 cm. long on complete extension. The testicles were about 4 to 5 mm. in diameter and were situated in the scrotum. The outlines of the prostate and seminal vesicles were impalpable. No secretion was expressed by massage of the prostatic region.

Treatment.—March 25 three pellets of crystalline testosterone weighing 277, 219 and 175 mg. were implanted in the right lumbar muscles. (In this case we used three relatively small pellets instead of one or two large ones because we wished to study the absorption rate of pellets of this size compared with the larger ones.)

Result.—The second day after implantation the patient began to notice an increased frequency of erections and he masturbated eight times in the subsequent three months. Ejaculation occurred for the first time in his life. The nipples soon became tender with the appearance of small lumps underneath, more marked on the left. At the end of the first month the voice began to

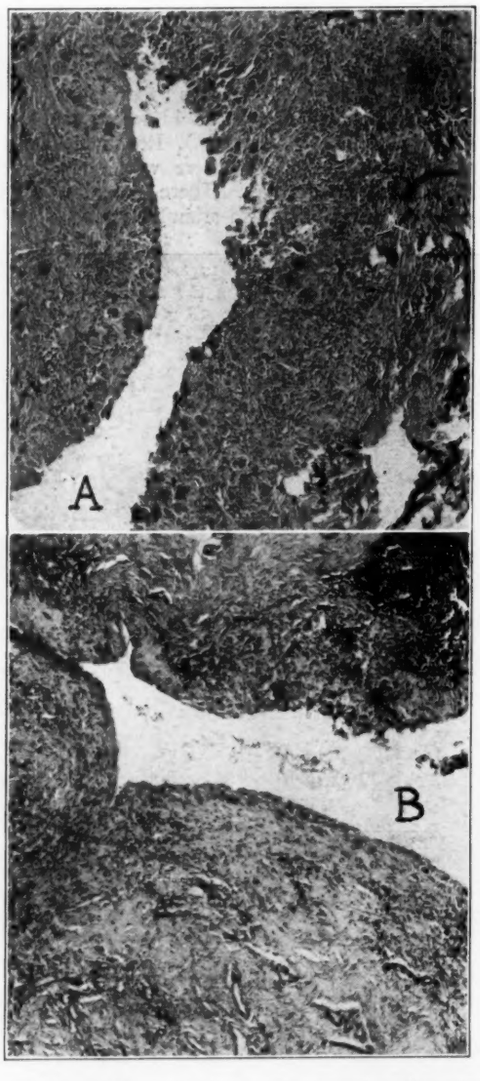


Fig. 6.—Sections of tissue showing reaction around cavities where pellets had been placed for three months in the subcutaneous tissue of arms of two patients. *A*, many giant cells with some round cells and leukocytes; *B*, fibrous tissue, some of which is hyaline, and a dense collection of round cells.

crack and assume a lower pitch. At the end of three months (June 23) a distinct increase of pubic hair had occurred, together with the appearance of profuse, thin, short hairs on the lower legs. The scrotum became larger and darker. The prostate was then three fourths of the normal adult size and of normal consistency and contour. The seminal vesicles were, however, barely palpable. Normal prostatic secretion was expressed. The penis increased in diameter and when completely extended measured 8.5 cm. Figure 4 *B* shows the patient's appearance June 23, ninety days after the pellet implantation. During this period he absorbed the three pellets completely, an average of at least 6.9 mg. a day. Pellets of this size absorb rapidly; his absorption rate was approximately twice that of what we have found in other patients who received a single large pellet. The patient is now continuing to develop with a single pellet weighing 778 mg.

CASE 2.—*History.*—J. R., a man aged 34, entered the James Buchanan Brady Urological Institute April 1, 1939. His brothers were normally developed. At the age of 15 the patient had his present degree of pubescence. Since then he had had an occasional erection, with rare masturbation without ejaculation.

Examination.—The patient presented a eunuchoid appearance. Figure 5 *A* shows the patient before treatment. He was 5 feet 5¾ inches (167 cm.) tall. A roentgenogram showed delayed union of the epiphyses with the skeletal age of a youth 18 years old. There was present 25 rat units of follicle stimulating factor per liter. The genitalia were undeveloped (fig. 5 *A*). The penis was 4.5 cm. long on complete extension. The testes were 1 cm. long and were situated in the upper part of the scrotum. Considerable pubic, rectal and perineal hair was present. No hair was present on the chin, body or extremities. A tiny amount of prostatic tissue could be felt around the urethra. The seminal vesicles were indefinite. No secretion could be expressed by massage.

Treatment.—April 10 a pellet of pure testosterone weighing 750 mg. was implanted into the scrotum. The scrotum was selected because of its superficial position where the pellet could easily be palpated from time to time. It is possible that absorption from the scrotum is slower and not as satisfactory as from muscle or subcutaneous tissue.

Result.—Figure 5 *B* shows the patient's appearance two and one-half months after implantation, at which time it seemed by palpation that only about one third of the pellet had been absorbed. During this time he complained of erections practically all night and frequently during the day. The testes descended to the bottom of the scrotum so that the left came to lie just adjacent to the pellet. The voice became deeper. He gained 4 pounds (1,814 Gm.) the first two weeks and 3 pounds (1,307 Gm.) the following two weeks. He began to masturbate three or four times a week, with ejaculation. Slight tenderness appeared in both breasts, especially the left. Hair began to grow on the lower legs and the upper lip. In two and one-half months (fig. 5 *B*) the penis had increased in size and was now 6.3 cm. in complete extension. The prostate had developed to about two thirds normal size. It was normal in contour, shape and consistency. Several drops of secretion could be expressed which were normal in appearance and normal microscopically. The seminal vesicles were easily palpable and almost normal in size.

The clinical results, though just beginning in these patients, is indicative of the activity of crystalline testosterone when implanted subcutaneously in the form of pellets. The method may prove to have important clinical applications, but more extensive work is necessary to establish this with certainty.

It has been of interest to study the type of tissue reactions which occur around pellets of testosterone. Figure 6 *A* and *B* shows photomicrographs of the tissue encapsulating pellets four months after implantation. In figure 6 *A* the cavity in which the pellet was situated is visible. Surrounding this cavity is granulation tissue containing many foreign-body giant cells, an occasional leukocyte and some round cells, all lying in a fibroblastic matrix. In 6 *B* (another case) there is less reaction to the foreign body, with only a rare giant cell. Much fibrous scar tissue has developed, some of which is hyaline. A dense collection and some diffuse round cells are seen. There is no evidence of unusual cellular reaction, metaplasia or carcinogenic activity.

It is possible that such an instrument as we have developed and presented here might be applicable to injection of other solid medicinal materials.

University Hospital, Charlottesville, Va.—24 East Eager Street, Baltimore.

THE PROTECTION OF CHILDREN FROM TUBERCULOUS ADULTS

FAIRFAX HALL, M.D.
NEW ROCHELLE, N. Y

There is a definite hazard to the health of children from intimate association with persons about whom little or nothing is known with regard to freedom from tuberculosis or other communicable conditions. Since parents are much more apt to have had adequate medical supervision than the servants in a home, the risk to children from the latter is greater. Occasionally an older member of a family, mistakenly thought to have "chronic bronchitis" or "asthma," is a factor to be considered in safeguarding a child from tuberculosis. School teachers with active tuberculosis are a menace to their pupils.

The New York Tuberculosis Association in 1922, through the instigation of Dr. Charles Hendee Smith, made a study of the subject of protecting children from tuberculous servants.[1] It was stated that "every stranger who comes into our household carries an insidious threat against our nearest and dearest, the children," and "it is high time to combat this very real danger." It was concluded that all persons in contact with children should undergo periodic medical examinations.

It is unnecessary to detail the several instances among my patients in which a primary tuberculous infection was acquired from a servant or other member of the household. Every physician with experience in the care of children knows of instances in his own practice of primary tuberculosis from exposure to tuberculous adults in the home. With a few of my own child patients infected in this way the outcome was tragic. In others the tuberculin reaction was positive without clinical evidence of pulmonary lesions during childhood.

A large number of children in whom the tuberculin reaction was positive before 7 years of age were followed for 11 years by Ch'ui, Myers and Stewart.[2] Nine times more of these children developed the reinfection type of disease than did those of a control group in whom the tuberculin test was negative at the same age. This is conclusive evidence of the potential danger to the future health of a child when the tuberculous infection is acquired early. It shows that a positive tuberculin reaction in childhood is undesirable and may be a more serious matter than a positive Wassermann reaction.

The fact is, practically all childhood tuberculosis is contracted from association with adults who have the disease in an open form. I agree emphatically with Dietrich [3] that to prevent the contact of tuberculous persons with children is as worthy a project as was that to eliminate tuberculous dairy cattle from the production of milk. By proper foresight and appropriate action this can be done.

At the time when C. H. Smith [1] made the attempt to attack the problem of the tuberculous servant he encountered many difficulties which are still present, although possibly to a less degree. The public is now more fully aware than in the past of the danger to children from contact with open tuberculosis. This and the campaign of education regarding syphilis have made parents willing and anxious to keep diseases of a communicable nature out of their homes and away from their children.

Prevention of contact between children and tuberculous nursemaids or other domestic helpers will be less frequent when parents are so convinced of the necessity of employing only healthy servants that they will demand proof of their servants' health. Too frequently a great deal of resistance has to be broken down and prejudices overcome before servants can be induced to submit to this procedure. Domestics having to do with the care of young children must be persuaded that it is to their advantage to have periodic medical examinations so that they will secure them as a matter of course. When "health references" are universally asked for and a health card is essential to get a job, a great step forward will have been made. Physicians interested in child health should influence their patients to take this wise precaution for the sake of the children.

The danger to children from a tuberculous school teacher is illustrated dramatically by the case of a teacher in Minnesota reported by the Jordans.[4] This teacher, with unrecognized far advanced tuberculosis, in addition to teaching chemistry instructed the band and orchestra. Often he would blow into a child's instrument, showing him how to execute a difficult passage. The child then returned it to his own lips, with a definite sputum transfer. It was found that 33⅓ per cent of the boys of the band reacted positively to the Mantoux test while the pupils of the school as a whole were 15.72 per cent positive, a 100 per cent greater incidence among his pupils.

The teachers and janitors in this school were 49 per cent positive to the Mantoux test. Five of the 173 examined had reinfection adult type pulmonary tuberculosis.

In a tuberculosis survey in Macon County, Ill.,[5] of 705 school teachers given x-ray examinations 315 were found to be infected and nine were actively tuberculous. Lindberg concludes with the statement that "while the school teacher has not more tuberculosis than the average adult, next to the family she provides the greatest opportunity for close prolonged contact with the school child. To require the teacher to provide a health certificate, including chest films, would serve to remove this reservoir of infection."

As a result of tuberculin tests and x-ray examinations of more than 6,066 school teachers in a survey in several parts of the country, 2.15 per cent were found to have tuberculosis in a stage requiring treatment. On this basis Lees [6] concludes that among the 871,607 teachers in our elementary and secondary schools 18,739 tuberculous teachers were in active service in 1936. This statement was confirmed by Myers.[7]

L. S. Jordan [8] maintains that the prevention of infection is the primary step in the control of tuberculosis.

Read before the region I meeting of the American Academy of Pediatrics, New York, June 1, 1939.

1. Smith, C. H.: Healthy Servants Only in a Healthy Home, New York Tuberc. A. Bull. **3:** 1 (Sept.-Oct.) 1922.
2. Ch'ui, P. T. Y.; Myers, J. A., and Stewart, C. A.: The Fate of Children with Primary Tuberculosis, J. A. M. A. **112:** 1306 (April 8) 1939.
3. Dietrich, Henry: Tuberculosis in Infancy and Childhood, Arch. Pediat. **42:** 197 (March) 1930.
4. Jordan, L. S., and Jordan, K. B.: Minnesota Med. **16:** 555 (Sept.) 1933.
5. Lindberg, D. O. N.: The School Teacher as a Source of Tuberculosis Infection, Illinois M. J. **68:** 350 (Oct.) 1935.
6. Lees, H. D.: Tuberculosis Among Teachers, Bull. Nat. Tuberc. A., June 1936.
7. Myers, J. A.: Educators and Tuberculosis, J. Nat. Educ. A., January 1939.
8. Jordan, L. S.: The Teacher, Journal Lancet **56:** 187 (April) 1936.

"Find the source" was his slogan. He found the sputum positive in eight of 786 teachers tested. He reported further that of sixty-four pupils exposed to a teacher with far advanced pulmonary tuberculosis 42.6 per cent were positive to the Mantoux test, while of 161 other pupils of the same school and age group 11.2 per cent were positive. This is definite evidence of the increased incidence of infection resulting from contact with a teacher having open tuberculosis.

The approach, methods employed and results of a tuberculosis survey of teachers and janitors in the schools of Minneapolis sets an example which can well be followed by any community which has not already established a satisfactory system of its own. This is described by Harrington, Myers and Levine [9] in reporting the examination of 3,600 Minneapolis school employees. Sixty-eight showed x-ray evidence of disease necessitating further observation. Six were found to have tubercle bacilli in their sputum.

In 1930 Dietrich [3] reported three families in which four children developed tuberculosis (two of them died) following contact in their homes with tuberculous nursemaids. He also told of a kindergarten teacher with active pulmonary phthisis whose association with her 5 year old pupils resulted in the primary tuberculous infection of several of them. Dietrich found at that time that there were laws in five states requiring teachers to be free from tuberculosis and no laws in respect to the health of nursemaids and governesses. He recommended health examinations for all nursemaids, governesses and kindergarten teachers and issuance of cards to all healthy applicants.

Rogers [10] in 1934 summarized all aspects of the care of teacher health in this country as follows: About two thirds of the largest cities required a certificate of health from teachers before appointment. The smaller the community, the fewer had such a regulation. At that date, in twenty states, examination before employment was required by law. Nowhere was a tuberculin reaction or lung x-ray examination mentioned as a requisite part of the examination. In few, if any places was repetition of examinations at stated intervals part of the health program for teachers. When free medical consultation service was offered, teachers seldom made use of it, probably because of fear that the result of an examination might react to their disadvantage.

One cannot help concluding that, for school teachers to be proved healthy and free from transmissible disease, medical examination must be compulsory and repeated at regular intervals. These examinations should include a tuberculin test and x-ray examination of the lungs and should be made by a physician who is uninfluenced by any personal considerations which might affect his report. In 1934 Philadelphia was the only city with a teacher health program approaching this ideal. Recently New York City has required thorough examination of new teachers with periodic reexamination.

The American Academy of Pediatrics has endorsed the principle of healthy adults in contact with children. A campaign is in progress to bring to the attention of doctors, parents, servants, trained nurses and teachers facts relative to this aspect of child health. Through its Committee on Contact Infections, with the assistance and cooperation of many child health minded organizations, the program of education is under way. Pediatricians and family physicians can accomplish a great deal by advocating that parents, other members of the family, servants, nursemaids and trained nurses, because of their intimate contact with children, should have periodic health examinations.

County and other medical societies throughout the country are sponsoring a standardized examination designed to detect any contagious condition. The examination will include an x-ray examination of the lungs, at least for all who are tuberculin positive. The examination will be available at a low rate of charge. In most instances the radiologists are cooperating by charging a minimum fee for the chest film.

The American Academy of Pediatrics advocates that examinations be undergone voluntarily, through an appeal to reason, rather than from compulsion. What provision is made for obtaining examinations will depend on the conditions existing in each locality. It is desirable that examinations of all who are employed be made by practicing physicians. In communities where the wage scales of domestics do not permit the payment of a fee sufficient to compensate a doctor for the time required for an adequate examination and for an x-ray examination, the applicants will be examined in clinics for a nominal fee or no charge.

As part of this program for examination of domestic servants in Knoxville, Tenn., Dr. Oliver W. Hill [11] reports that, in 1938, 571 persons with syphilis, sixty-seven with active tuberculosis and five typhoid carriers were picked up and put out of circulation.

Finding persons with insufficiently or untreated syphilis is an important feature of this project. It is thought that the benefit from this will be greater to the individual needing treatment than to the children with whom they are associated. The communicability of this disease to children through kissing is possible, though infrequent, when compared with tuberculosis, in which the contagious stage lasts for a much longer period. Smith [12] was able to collect but 125 cases of acquired syphilis in children under 11 years of age.

There can be no question that this program will be advantageous to the health of children by protecting many of them from unnecessary illness. In addition, the individuals examined may have much to gain through the discovery of conditions needing medical attention.

The practicing physician is the person to take the lead by advocating this health protection. The success of the program depends to a great extent on his recommendation. The physician can go even further in setting an example by himself having a physical examination and an x-ray examination of the lungs.

CONCLUSIONS

1. Tuberculosis in children is acquired almost exclusively from contact with infected adults in their homes and in school.

2. School teachers should be proved to be free from communicable tuberculosis. In very few communities in this country is this being done.

3. Domestic servants and nurses should have periodic medical examinations and be required to furnish a "health reference" of freedom from transmissible disease.

9. Harrington, F. E.; Myers, J. A., and Levine, Ida: Tuberculosis Among Employees of the Minneapolis Schools, J. A. M. Acad. **104**: 1869-1874 (May 25) 1935.

10. Rogers, J. F.: The Welfare of the Teacher, Bull. 4, U. S. Department of Interior, 1934.

11. Hill, O. W.: Personal communication to the author.

12. Smith, F. R., Jr.: Acquired Syphilis in Children, Am. J. Syph., Gonor. & Ven. Dis. **23**: 165-185 (March) 1939.

4. Parents, relatives and pediatricians should also be examined at intervals.

5. Cooperation with the program of the American Academy of Pediatrics for healthy adults in contact with children will result in fewer cases of childhood tuberculosis infection.

421 Huguenot Street.

Clinical Notes, Suggestions and New Instruments

RAPID RECOVERY FROM TYPE XIII LOBAR PNEUMONIA TREATED WITH RABBIT SERUM

OF A PATIENT WITH ADDISON'S DISEASE UNDER TREATMENT WITH DESOXYCORTICOSTERONE

FORD K. HICK, M.D., AND BRODA O. BARNES, M.D.
CHICAGO

This report is made to change a conception of prognosis in Addison's disease complicated by infection. Undoubtedly, many physicians have seen patients with Addison's disease survive infections. Usually such subjects are treated as though they were in crisis. This man had been controlled with desoxycorticosterone and had returned to work when seized with lobar pneumonia. He was continued on the same dose of the synthetic hormone plus 5 cc. of adrenal cortex extract[1] daily and made a rapid, complete recovery.

We feel that this result further confirms the efficiency of the substitution therapy with desoxycorticosterone in Addison's disease and that infection should not upset these patients too much, provided a specific treatment is available for the infection.

REPORT OF CASE

A white man of 38, a salesman, entered Henrotin Hospital May 8, 1939, with the complaint of weakness, dizziness, loss of appetite and loss in weight. He had been well until the fall of 1938, when he began to grow weaker and to eat poorly. His symptoms were considerably aggravated by influenza in February 1939, when he was away from work one month because of weakness. Dizziness came on standing up suddenly, on moving about or with exercise. On a few occasions he had fallen. Lying down always put an end to the dizziness. His weight had gone from 148 to 130 pounds (67 to 59 Kg.) on entrance since November 1938. There was a considerable aversion to food, and nausea was frequent this spring. He had not vomited or had severe abdominal pain.

The past history was irrelevant except that he had been sick for a few weeks with pneumonia at the age of 20.

The patient was a slender man, not acutely ill, with considerable brown pigmentation about his head, which was bald, and the neck, arms and sides of the body, especially the lateral aspect of each hip. His strength was fair in the arms and legs.

The blood pressure was found to be 60 systolic, 40 diastolic standing up and 78 systolic, 50 diastolic while sitting up. While lying down the lowest figure was 86 systolic, 56 diastolic. The laboratory work-up showed no abnormality save that the serum sodium was 133 milliequivalents per liter, compared to the normal of 140 or more.

Treatment was started with 10 cc. of adrenal cortex extract and 4 Gm. of salt daily. There was marked subjective improvement. His weight began to increase as his appetite returned. After six days on this treatment he was placed on 5 mg. of desoxycorticosterone subcutaneously each day, on which his weight came up to 138 and his blood pressure stabilized at about 120 systolic, 80 diastolic, and he returned to work.

June 23 he had a slight nasal discharge and fulness in the head. The blood pressure was 114 systolic, 80 diastolic, while standing. Next morning at 2 o'clock he had a chill and vomited twice. On returning to the hospital at 5 a. m. he was acutely ill. The temperature was 104.4 F., pulse rate 100, respiratory rate 30 and blood pressure 146 systolic, 90 diastolic. The accessory muscles of respiration were in use. There were questionable harsh breath sounds over the left lower lobe posteriorly. He was given 1,000 cc. of 5 per cent dextrose in physiologic solution of sodium chloride.

The sputum contained type XIII pneumococci and antiserum was started at 1 p. m., 200,000 units of rabbit serum being given undiluted by 8 p. m. The white count was 7,200, the blood culture negative.

June 25 the peak temperature was 99.4 F., the blood pressure 120 systolic, 72 diastolic. The patient felt well but coughed up a little bright red sputum. He had no more fever but showed dulness and rales over the left lower lobe for two days. An x-ray examination confirmed the diagnosis of lobar pneumonia. Retyping the sputum showed the same organism.

The management of Addison's disease during the pneumonia was 1 Gm. of salt daily, a general diet along with desoxycorticosterone 5 mg. daily subcutaneously, and 5 cc. of adrenal cortex extract for four days. The maintenance dose of 5 mg. of desoxycorticosterone daily is again adequate. The patient returned to general activity June 29.

1853 West Polk Street.

From the University of Illinois College of Medicine and Henrotin Hospital.

1. The substance used was Wilson Laboratories "Cortin."

SUMMARY OF SOME CLINICAL STUDIES ON VITAMIN K

ERIK TAGE-HANSEN, COPENHAGEN, DENMARK

In continuation of the work of Dam and Glavind[1] I have in the past year carried out a series of investigations on patients with diseases in which lowered prothrombin might be expected. The determination of prothrombin was made by the method described by these authors. It was found to work satisfactorily. In fourteen of the cases in which lowered prothrombin (high R-values) were found, the different ways of administering vitamin K were also studied.

Dam and Glavind[1] reported the treatment of five cases of obstructive jaundice with K-avitaminosis by intramuscular injections of an emulsion of vitamin K in water and found it possible to restore the blood coagulation to the normal value within a week.

Since then I have studied the effect of vitamin K when given perorally, intramuscularly and intravenously.

For peroral use gelatin or starch capsules containing the concentrate together with desoxycholic acid were prepared. In accordance with the studies of Butt, Snell and Osterberg,[2] normal coagulation was obtained within two days with doses of from 100,000 to 200,000 Dam units of vitamin K plus 2 Gm. of desoxycholic acid. Some days later the coagulation defect began to set in again.

By ingestion of an emulsion of the vitamin in sodium desoxycholate solution by duodenal or stomach tube the same effect was obtained.

For injection purposes, concentrates having a strength of more than 1 million units per gram were used.

Intramuscular injection on two successive days of a watery emulsion of such a preparation representing 150,000 units of vitamin K resulted in normal coagulation three days after the first injection, an observation which is in accordance with the results reported by Dam and Glavind.

Intramuscular injection of an oil solution of the vitamin in a one day or in a three to five day period led to restoration of normal blood coagulation after one to two weeks, from 150,000 to 400,000 units in all being used for each patient. In some cases in which surgery was not employed, it could be shown that the effect lasted for at least three weeks.

1. Dam, Henrik, and Glavind, Johannes: Vitamin K i den menneskelige Pathologi, Ugesk. f. læger **100**: 248-250 (March 10) 1938; Vitamin K in Human Pathology, Lancet **1**: 720 (March 26) 1938; The Clotting Power of Human and Mammalian Blood in Relation to Vitamin K, Acta med. Scandinav. **96**: 108-128, 1938.

2. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: Further Observations on the Use of Vitamin K in the Prevention and Control of the Hemorrhagic Diathesis in Cases of Jaundice, Proc. Staff Meet., Mayo Clin. **13**: 753-764 (Nov. 30) 1938.

Intravenous injection of emulsions—from 15,000 to 30,000 units in one dose—yielded normal blood coagulation within eighteen hours, but as in the case of peroral introduction the effect persisted for only a few days.

The foregoing results are in accordance with corresponding experiments on animals.

Similar results have been obtained with all three forms of administration against the hypoprothrombinemia of newborn and older infants suffering from icterus gravis neonatorum and certain related diseases.[3]

In urgent cases it is a great advantage that two rapidly acting forms of application are now available: intravenous injection and ingestion together with bile, of which the first is the most efficient.

The intramuscular injection of oil solutions is remarkable for the long duration of the effect.

The proper treatment of each case is rendered possible by taking advantage of the different modes of application, preferably by a suitable combination of them.

Biochemical Institute, University.

Special Clinical Article

TYPE SPECIFIC POLYSACCHARIDE SKIN TEST IN SERUM THERAPY OF PNEUMONIA

CLINICAL LECTURE AT ST. LOUIS SESSION

JOSEPH C. EDWARDS, M.D.
CHARLES L. HOAGLAND, M.D.
AND
LAWRENCE D. THOMPSON, M.D.
ST. LOUIS

The application of the intracutaneous test with type specific pneumococcic polysaccharide as a guide in serum therapy rests on a basis as sound theoretically as that of the Schick test in the measurement of dermal resistance to diphtheria toxin. In the case of the pneumococcus polysaccharide a positive reaction indicates resistance to the pneumococcus, while in the Schick test a positive reaction is indicative of a lack of such resistance. In either case, however, dermal reactivity is used as a criterion of the immune status of the whole organism.

That pneumococci are not alike was an observation made in 1897 by Bezançon and Griffon,[1] who reported serologic differences among morphologically indistinguishable pneumococci. Briefly, the intact pneumococcus cell may be considered to exist as a body, or soma, of bacterial protein, surrounded by a discrete capsule consisting of a carbohydrate substance of relatively complex structure. When released from the intact pneumococcus cell, this material is water soluble and may be precipitated from autolyzed cultures by appropriate concentrations of alcohol or acetone, following in general the precipitation reaction of all complex soluble carbohydrates.

It was the significant discovery of this capsular material, or the so-called soluble specific substance, by Dochez and Avery in 1917 [2] that has led to a more or less exact understanding of the qualitative differences existing among the thirty varying types of pneumococci.

The intensive studies of Heidelberger, Avery, Kabat and Goebel [3] have given more exact information concerning the structure of certain of these type specific polysaccharides and their relation to specificity. The capsular material of the common groups, at least of types II, III and VIII, appears to be composed of dextrose and glucusonide units (aldobionic acid) in a carbohydrate chain. Type I contains, as a basic group, a trisaccharide with the two uronic acid molecules and an amino sugar.[4] Until recently it was believed that the uronic acid group was common to all pneumococci and formed a basic antigenic unit. The structure of type XIV, however, does not conform to this concept, in that it is composed of hexosamine units with no demonstrable trace of uronic acid.[5] In the case of II, III and VIII the difference appears to be chiefly one of stereochemistry, or the arrangement of the basic unit in space.

These polysaccharides when coupled with a more or less common pneumococcus protein form complete antigens. The orientation of the antigenic action in the production of antibody, however, is a function of the carbohydrate group comprising the capsule. Although in most animals the material depends on the protein portion for its complete antigenic action, it will, in its chemically pure form, react by precipitation with homologous antipneumococcus serums in dilutions as high as 1 to 4,000,000. Felton has studied its value as a vaccine.[6]

For use in skin testing only chemically pure capsular material can be employed. Much of the earlier work is equivocal, owing to the fact that impure carbohydrate substances were used. The pneumococcus contains, in addition to its type specific capsular polysaccharide, a so-called somatic, or C, fraction, which is nonspecific and may give a latent reaction directed against the nonspecific, or somatic, antibody. In addition, the somatic substance contains yeast nucleic acids and nucleoproteins which are severe skin irritants and often contaminate improperly prepared capsular material. A report of the more detailed technic employed by one of us (C. L. H.) in the isolation of the pure carbohydrate fractions will be published later. White, Robinson and Barnes discussed the various methods thus far employed.[7]

3. Dam, Henrik; Tage-Hansen, Erik, and Plum, P.: K-Avitaminose hos Spæde Børn som Aarsag til Hæmorrhagisk Diathese, Ugesk. f. læger **101:** 896 (Aug. 3) 1939.

From the Department of Internal Medicine, Washington University School of Medicine.

The work was made possible by grants to the Washington University School of Medicine from Eli Lilly & Co., Indianapolis.

Read in the General Scientific Meetings at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 15, 1939.

The visiting and resident staffs and the laboratory personnel of St. Louis City Hospital, Barnes Hospital, St. Louis County Hospital, Jewish Hospital, St. Luke's Hospital and St. Mary's Hospital and the Department of Health of the City of St. Louis cooperated in this study. Eli Lilly & Co. supplied antipneumococcus rabbit serum and certain of the pneumococcus cultures from which Dr. C. L. Hoagland extracted the polysaccharides.

1. Bezançon, F., and Griffon, V.: Pouvoir agglutinatif du serum dans les infections experimentales et humaines à pneumocoques, Compt. rend. Soc. de biol. **49:** 551, 1897.

2. Dochez, A. R., and Avery, O. T.: Soluble Substance of Pneumococcus Origin in the Blood and Urine During Lobar Pneumonia, Proc. Soc. Exper. Biol. & Med. **14:** 126, 1917.

3. Heidelberger, Michael, and Avery, O. T.: The Soluble Specific Substance of Pneumococcus, J. Exper. Med. **38:** 73 (July) 1923. Heidelberger, Michael, and Kabat, Elvin A.: Chemical Studies on Bacterial Agglutination: I. A Method, ibid. **60:** 643 (Nov.) 1934. Heidelberger, Michael, and Goebel, W. F.: The Soluble Specific Substance of Pneumococcus: V. On the Chemical Nature of the Aldobionic Acid from the Specific Polysaccharide of Type III Pneumococcus, J. Biol. Chem. **74:** 613 (Sept.) 1927. Avery, O. T., and Goebel, W. F.: Chemo-Immunological Studies on the Soluble Specific Substances of Pneumococcus: I. The Isolation and Properties of the Acetyl Polysaccharide of Pneumococcus Type I, J. Exper. Med. **58:** 731 (Dec.) 1933.

4. Marrack, J. R.: The Chemistry of Antigens and Antibodies, Medical Research Council, Special Report Series, No. 230, London, His Majesty's Stationery Office, 1938, p. 97.

5. Hoagland, C. L.; Beeson, P. B., and Goebel, W. F.: The Capsular Polysaccharide of the Type XIV Pneumococcus and Its Relationship to the Specific Substances of Human Blood, Science **88:** 261 (Sept. 16) 1938.

6. Felton, L. D.: Studies on Immunizing Substances in Pneumococci: VII. Response in Human Beings to Antigenic Pneumococcus Polysaccharides, Types I and II, Pub. Health Rep. **53:** 1855 (Oct. 21) 1938.

7. White, Benjamin; Robinson, E. S., and Barnes, L. A.: Biology of Pneumococcus, New York, Commonwealth Fund, Division of Publications, 1938, p. 473.

The rationale of the skin test itself rests on the observations of Mackenzie and Woo [8] in 1925 of an allergic condition in the skin of guinea pigs following immunization by killed pneumococci. That the mechanism might be used as a guide in serum therapy was suggested in 1933 by Francis,[9] who observed that 100 per cent of patients with type I pneumonia developed at the time of crisis an urticarial wheal following the intracutaneous inoculation of a dilute aqueous solution of type I capsular polysaccharide. In an earlier communication Tillett and Francis [10] had observed that the skin reaction to capsular polysaccharide appeared in many patients after treatment with homologous antipneumococcus serums and that when such reaction occurred the prognosis was excellent. The fact that the reaction appeared quickly, sometimes within thirty minutes after serum administration, made it a desirable method of ascertaining when an adequate amount of serum had been administered without waiting for the drop in temperature and the clinical improvement which formerly were the only guides to adequate serum therapy.

It has been established by the work of Freund [11] and others that the skin is the last organ to become sensitized after the parenteral administration of immune serums. This knowledge is particularly applicable to the use of the skin test in the control of serum dosage, since a positive reaction must indicate complete organic saturation with antibody, a therapeutic ideal. That the skin test is also applicable to patients treated with horse serum as well as with rabbit serum has been established by MacLeod, Hoagland and Beeson [12] and Finland and Sutliff.[13]

CLINICAL STUDY

A total of 114 patients were treated with type specific antipneumococcus rabbit serum [14] in several hospitals. Both serum and polysaccharide were available for types I, II, V, VII, VIII and XIV. In addition, we had polysaccharide for types III, IV and VI. It was confirmed by clinical trial that all were free of the C substance.

In an effort to make the study uniform, all the patients were examined by one of us, who viewed the roentgenograms, supervised the administration of serum and performed the polysaccharide skin tests before, during and after serum administration. Each serum was monovalent and was given intravenously by a method to be described in another report.

Technic of the Skin Test.—In each case 0.05 cc. of a dilution of 1:10,000 type specific polysaccharide in physiologic solution of sodium chloride is injected intracutaneously on the flexor surface of the forearm, and the edges of the wheal so raised are sharply dotted with ink to enable one to detect the slightest alteration in contour or elevation after fifteen minutes. This is usually injected at the time of the tests for sensitivity to serum but may be delayed until after the intravenous test dose. If the rest of the serum is given in one or two doses within the next hour or so, there will usually be enough polysaccharide at the site of the previous test to react when sufficient serum has been given. It was our custom to repeat the test after each serum injection, although most of our serum was given as a large single dose one hour after the test dose.

If an urticaria-like wheal appears at the site of injection within twenty minutes, and especially if pseudopods form and the circumference of the wheal extends, the reaction is considered positive. A flare often accompanies the wheal formation but is not to be used as an index of positivity unless the control reaction is absolutely negative. It can be seen from the tables that the result is rarely positive until after serum has been given. Occasionally from five to eight days after onset, at or near the spontaneous crisis, the reaction becomes positive, indicating the presence of sufficient antibodies. Although not all patients have sufficient excess of antibodies to produce a positive result at the time of normal crisis, the majority will show it a day or so before or after normal crisis.

The test is repeated within three hours after the last serum has been given, and if the reaction is positive in the uncomplicated cases no more serum is needed. In the presence of complications such as bacteremia, more serum is needed even though the result is positive. A good rule to follow is to give more serum if there is doubt as to whether the reaction is positive or negative. An unequivocally positive reaction is always obtained after sufficient serum has been given, the only possible exception occurring when a patient is dying and has lost the reactivity of the skin.

Sterile stock solutions of the various capsular carbohydrates in 1:1,000 concentration in physiologic solution of sodium chloride keep indefinitely. For hospital use the 1:10,000 dilution keeps well at 40 to 60 C. all year, and from this dilution 0.1 cc. may be taken into a tuberculin syringe in order to inject 0.05 cc. intracutaneously. A similar amount of sterile physiologic solution of sodium chloride is injected as a control.

Scheme of Dosage.—Since few patients with fully developed pneumonia require less than 60,000 units of antiserum, this amount or more may be given as an initial dose, after which the absence of a positive reaction to the intracutaneous polysaccharide test is an indication for giving additional doses of 20,000 to 40,000 units at two hour intervals until the reaction becomes positive. Thus this test enables one in a sense to titrate with antibody, the type specific capsular carbohydrate being the indicator and a positive skin reaction denoting the end point.

It is difficult to establish clinically the point at which adequate serum has been given. A fall in the patient's temperature is an uncertain index, as it may follow temporarily the administration of any serum or foreign protein. If one waits for a secondary rise in temperature valuable time is lost, and a one or two day pneumonia may be converted into a two or three day disease with the attendant statistical increase in mortality.

With the use of the skin test, the delay between the first and the second dose is a matter of only two or three hours. Frequently the reaction becomes positive while the first dose of serum is being given, thus enabling one to save the unopened vials containing the

8. Mackenzie, G. M., and Woo, S. T.: The Production and Significance of Cutaneous Allergy to Pneumococcus Protein, J. Exper. Med. **41**: 65 (Jan.) 1925.

9. Francis, Thomas, Jr.: The Value of the Skin Test with Type Specific Capsular Polysaccharide in the Serum Treatment of Type I Pneumococcus Pneumonia, J. Exper. Med. **57**: 617 (April) 1933.

10. Tillett, W. S., and Francis, Thomas, Jr.: Cutaneous Reactions to the Polysaccharides and Proteins of Pneumococcus in Lobar Pneumonia, J. Exper. Med. **50**: 687 (Nov.) 1929.

11. Freund, Jules: Distribution of Immune Agglutinins in the Serum and Organs of Rabbits, J. Immunol. **14**: 101 (Aug.) 1927.

12. Macleod, C. M.; Hoagland, C. L., and Beeson, P. B.: The Use of the Skin Test with the Type Specific Polysaccharides in the Control of Serum Dosage in Pneumococcal Pneumonia, J. Clin. Investigation **17**: 739 (Nov.) 1938.

13. Finland, Maxwell, and Sutliff, W. D.: Specific Cutaneous Reactions and Circulating Antibodies in the Course of Lobar Pneumonia: I. Cases Receiving no Serum Therapy, J. Exper. Med. **54**: 637 (Nov.) 1931; II. Cases Treated with Antipneumococcic Sera, ibid. **54**: 653 (Nov.) 1931.

14. Refined, unconcentrated, supplied by Eli Lilly & Co.; hereafter referred to as "serum."

balance of the clinically estimated dose. In this way the test obviates the necessity for overtreatment. It has been customary in the past to overtreat as the lesser of two evils. In fact an amount in excess of the clinically calculated dose was formerly given in order to be safe. Overdosage offers no clinical advantage and subjects the patient to needless expense. Since the saving effected by the use of this test in our series amounted with but few exceptions to 20,000 to 100,000 units per patient, it is apparent that where serum is supplied to indigent patients by the state the use of the test has immense economic value.

TABLE 1.—*Incidence of Positive and Negative Polysaccharide Skin Test Before Serum Therapy*

Type of Pneumonia	Number of Patients	Number with Positive Test Before Serum	Number with Negative Test Before Serum	Number of Deaths
I	52	2	50	2
II	14	0	14	1
V	13*	1†	12	2
VII	14	0	14	0
VIII	19	1	18	0
XIV	2	0	2	0
Totals	114	4	110	5

* Two type V patients treated before polysaccharide was ready for use are not included.

† The only one of the five who died that had a positive test before serum.

In the presence of complications such as empyema, the temperature, pulse and respiration are no longer valued criteria of adequate therapy. Clinically the patient appears to need more serum, and frequently the presence of empyema may not be suspected. A positive skin reaction in such an instance indicates that the patient can be benefited not by additional specific therapy but only by procedures which will remove the focus of infection.

The presence of a positive skin reaction in the absence of clinical improvement after serum has been given may be the first sign of incipient pus or bacteremia.

It must be emphasized that in the rare cases, perhaps with bacteremia or endocarditis, the reaction may be negative even though type specific antibody is demonstrable in the blood and when the infection may be advancing. In such cases the skin test cannot be used as a criterion for serum dosage.

RESULTS

From table 1 it can be seen that of a total of 114 patients with pneumonia 110 had negative reactions to the polysaccharide skin test before serum therapy. Of these, 105 showed a positive reaction after serum. Of the four patients who showed a negative result after serum, three subsequently died although they received more than enough serum (300,000 to 400,000 units) to cause a strongly positive skin reaction in the average patient with the same number of lobes involved.

Duration of Positive Reactivity to Skin Test.—In the few cases in which there was a history of hives, it was noted that the control with physiologic solution of sodium chloride did not cause a reaction. When skin tests were performed during the days of serum sickness, the results were in no instance interpreted as positive unless they were also positive after the recovery from serum disease.

From table 3 one can see that the patients who recovered displayed great variability in the duration of positive reactivity to the skin test after serum therapy. The duration did not vary directly with the dosage of serum or with the period from onset of the disease to the time serum was given. If, however, serum is given late in the course, the concentration of antibodies supplied by the patient himself may be increasing. The average duration was about ten days after serum was given. There seemed to be no relation between length of the positive phase of the polysaccharide test and serum sickness. The patients with complications tended to have a longer phase of reactivity than did those without complications.

Type I Pneumonia.—Of the fifty-two patients tested before and several times after serum therapy, only two had a positive result before serum was given. Of those with a negative result before serum all but one reacted positively after serum. This patient was given 60,000 units in the thirty-sixth hour of his pneumonia. The injection was followed within twenty-four hours by a crisis but without appearance of a positive reaction. Of the two patients who died, one had a positive reaction before serum therapy on the fifth day of disease and the blood culture became sterile after the total of 360,000 units had been given. Death occurred nine days later. At autopsy, consolidation of the entire right lung with an acute aortic endocarditis was demonstrated. The other patient's reaction remained negative before and after serum in the presence of fatal bacteremia.

Type II Pneumonia.—Fourteen patients were tested and all showed a negative reaction before and a positive reaction after serum was given. The only patient who died was admitted eight days after onset, was delirious and had bacteremia. Although patients with bacteremia late in the disease usually have sufficient antibodies to produce a positive reaction before serum is given, this patient did not, which of itself may be a bad prognostic sign. Blood taken before and twice after serum was given failed to show any agglutination with type II smooth organisms and only slight agglutination to a rough type II strain after serum was given. The result of the polysaccharide test was also negative. Large amounts of serum may fail to cause a positive reaction in such cases. Lack of tissue or skin reactivity may be a factor when antibodies are present but the result of the skin test is negative.

TABLE 2.—*Results of Skin Tests After Serum Therapy in Patients Showing a Negative Test Before Treatment*

Type of Pneumonia	Number of Patients	Results of Tests of Patients Who Recovered		Results of Tests of Patients Who Died	
		Positive	Negative	Positive	Negative
I	50	48	1	1	1
II	14	13	..	1	..
V	12	10	..	..	2
VII	14	14	..	..	..
VIII	18	18	..	..	..
XIV	2	2	..	..	..
Totals	110	105	1	2	3

Type V Pneumonia.—Twelve of thirteen patients had a negative reaction before serum was given. One of the two patients who died, who had a positive reaction before serum therapy on admission, three weeks after onset of the disease, had bacteremia with empyema. In spite of a normal temperature for three days and a negative blood culture after being given 300,000 units

of type V serum, he died on the ninth hospital day. Autopsy revealed an acute pneumococcus aortic vegetation. The other patient who died had negative reactions both before and after treatment with 340,000 units of serum. Bacteremia disappeared with seeming clinical improvement for several days. On the ninth hospital day death suddenly occurred from circulatory failure.

Type VII Pneumonia.—All fourteen patients had negative reactions before and all had positive reactions after serum therapy, with recovery.

Type VIII Pneumonia.—Of nineteen patients, eighteen had negative reactions and one a positive reaction before administration of serum.

Type XIV Pneumonia.—Two patients had negative reactions before and positive reactions after serum was given. Both recovered.

Pneumonia of Types III, IV and VI.—Several patients were tested at intervals and after the crisis, which occurred either spontaneously or with the aid

TABLE 3.—*Duration of Positive Skin Test* *

Days	Reaction Negative After Positive Phase	Units of Serum, Thousands	Reaction Positive on Patient's Discharge	Units of Serum, Thousands
3	1	60	1	140
5	2			
7	3	100, 80, 100	2	120, 240
9	3	100, 80	7	100
11	1	260		
13	..	...	3	220, 170
15	..	...	2	100, 100
17	1	80	2	100, 100
19	..	...	4	60, 200
27	..	...	1	160
31	1	220	1	220
Total cases	12		23	

* In thirty-four of the thirty-five cases reactions were negative before serum was given.

of sulfapyridine. In general, the patients treated with sulfapyridine had a negative reaction before the fifth day of the pneumonia, even those whose temperature fell on the first or second day. Very few had a positive reaction after the sixth to tenth day from the onset of the pneumonia, the time at which antibodies naturally occur in high concentration. Of the few patients seen at the time of spontaneous crisis, several had positive reactions to the polysaccharide test and recovered without specific therapy.

PNEUMONIA OF A SINGLE TYPE

A 21 year old man was admitted on the third day of type I pneumonia with a rectal temperature of 104 F., pulse rate of 100 and respiratory rate of 32 per minute. Slight cyanosis and delirium were present. The lower lobe of the right lung was consolidated. Clinically, it was estimated that at least 140,000 units of serum would be necessary and we prepared to give 160,000 units. The type I polysaccharide test, however, produced a positive reaction by the time 100,000 units of serum had been given. Crisis followed in twelve hours. Several such instances could be cited of patients in the older age group.

M. B., aged 70 years, was admitted on the seventh day of type VIII pneumonia with a temperature of 103 F., pulse rate of 100 and respiratory rate of 24. There were no signs of approaching crisis. The white cell count was 30,400, with a marked shift of segmented leukocytes. Consolidation of the right middle lobe was evidenced by physical signs and a roentgenogram. Types I and VIII polysaccharide skin tests yielded negative results. Eighty thousand units of type VIII serum caused a crisis in sixteen hours, and the reaction to the type VIII skin test was positive. The next day it was 3 plus; it became negative one week later. The patient recovered uneventfully.

J. B., aged 72 years, the husband of M. B., was admitted four days after his wife on the second day of his disease, which partially involved the right upper lobe, beginning at the hilus. This was also due to the type VIII pneumococcus. The temperature was 102.6 F., pulse rate 115 and respiratory rate 26. The type VIII polysaccharide test did not produce positive results until after 100,000 units of serum had been given. Crisis occurred within twelve hours. The reactions remained positive for the duration of the hospital stay of ten days.

V. P., aged 28 years, was admitted on the eighth day of type II pneumonia and had 100,000 units of type II serum; the reaction did not become positive until another 40,000 units had been given. Crisis occurred in twenty-four hours and recovery ensued. In this case one would have estimated that an additional 40,000 units, at least, was necessary.

L. C., aged 21 years, was given 100,000 units of type I serum on the fourth day of pneumonia of type I in the left lower lobe. The polysaccharide test produced a negative reaction before and a positive reaction one hour after the serum therapy. In twelve hours, however, the reaction was negative although the temperature was normal. Subsequent tests gave negative results for the next seven days, after which the reaction became positive again, on the eleventh day from onset of the pneumonia, remaining positive for the next three days of the hospital stay. More serum was not given when the reaction became negative because clinically the patient was well on the road to recovery, with normal temperature and respirations and with but slight elevation of pulse rate. Had the temperature become elevated above 101 F. (rectal) with a negative reaction, in the absence of other causes for the temperature, more serum would have been indicated.

If the temperature remains elevated, the reaction positive and the disease unaffected by the usual amount of serum, the sputum should be retyped. Thus it is best to combine clinical judgment with all tests. Apparently enough serum was given to control the infection but not enough to diffuse into the skin and react with the polysaccharide. If bacteremia had been present, more serum would have been indicated as soon as this was determined, in spite of a positive or negative reaction to the skin test with type specific polysaccharide.

PNEUMONIA OF MORE THAN ONE TYPE

That the polysaccharide test is of value in the differential treatment of pneumonia due to more than one type is shown by the following cases:

A 26 year old woman entered on the second day after onset of pneumonia with a chill, cough and rusty sputum. Types III and VIII pneumococcus were directly found in the sputum by the modified Neufeld technic. Early consolidation of the right lower lobe was present. Since the type VIII organisms were present in greater number per oil immersion field than the type III, 80,000 units of type VIII serum was given and crisis occurred in twelve hours. The reaction was negative for types III and VIII before and positive for type VIII after serum therapy.

A patient with type I pneumococcic pneumonia, recovering spontaneously, was admitted on the tenth day with a temperature of 104 F. after two days of normal temperature. Careful physical and roentgenographic examination revealed a parenchymal process in the right middle lobe. The original process had been in the left lower lobe. A skin test with type I polysaccharide yielded unequivocally positive results, showing the presence of a homologous antibody and reactive dermis. The presence of empyema was not suggested by physical and roentgenographic signs. No sputum was available, whereupon a lung puncture was performed; type VIII pneumococcus was isolated directly from the new area of involvement. There was prompt defervescence following the administration of type VIII antipneumococcus serum; on recovery the patient reacted to both type I and type VIII polysaccharides.

T. H. had a typical onset with chills and rusty sputum three days before entry. Type VII pneumococcus was isolated directly from the sputum and 100,000 units of type VII horse serum was given. Two days later the temperature was still elevated, being 104.6 F., the pulse rate was 122 and the respiratory rate 32. Since the reaction to the type VII polysaccharide test was positive we were assured that enough serum had been given. No evidence of empyema or bacteremia was found. Accordingly the sputum was retyped, and this time type I pneumococcus was found in abundance with a few type VII organisms. Type I skin test was negative and 160,000 units of the homologous serum was given before the skin reaction became positive for type I, this being the fifth day of the disease. Within twenty-four hours the temperature was normal. Reaction to the type VII polysaccharide test became negative eleven days after serum was given, when the reaction to the type I test was still positive. Recovery was uneventful.

In seven instances of pneumonia with more than one type of pneumococcus in the sputum, the skin test enabled us to know that adequate amounts of serum had been given for one of the types in each case and that serum was the logical cause of the crisis which occurred within at least forty-eight hours and before the seventh day of the disease. In two of these cases, lung puncture was done to determine the actual cause of the pneumonia, which proved to be pneumococcus of the same type as that for which serum was given. This was necessary when the multiple types in sputum were of the more common variety. Sulfapyridine can also be used to advantage in such cases.

FOUR SPECIAL CASES

All patients were treated without selection as soon as the organism could be typed. Four patients who were moribund on admission were treated with serum in order to determine what little benefit might accrue. In all but one of these cases, which will be described, the type specific polysaccharide test was found to give negative results before and after therapy with large amounts of serum. It appears that in the presence of terminal shock the skin is no longer reactive. The reaction was positive before and after serum administration in one moribund patient admitted twenty-one days after onset of type V pneumonia involving the entire left lung, with an encapsulated empyema and type V pneumococcus in the blood culture. The blood culture was sterile after 300,000 units of serum had been given. The temperature was almost normal for three days after serum therapy, but the patient died on the ninth hospital day. Sulfapyridine was given the day after the second rise in temperature and continued for five days. Aortic valvular pneumococcic endocarditis was seen at autopsy in addition to the lesions described. The other three patients died within twelve hours of admission but none of them had a serum reaction. There were no great variations in blood pressure and pulse.

SUMMARY

In 114 cases of lobar pneumonia caused by type I, II, V, VII, VIII or XIV pneumococcus, type specific antipneumococcus rabbit serum was used. The reaction of the patient to intracutaneous tests with the type specific polysaccharide from the capsule of a homologous type of pneumococcus was determined before, during and after the administration of the serum.

One hundred and ten of the patients had a negative reaction to the test, indicating a low content of circulating antibody, before serum was given. The test proved to be a valuable aid in the more accurate estimation and control of the optimum dose of serum necessary for the successful treatment of the patient.

In thirty-five cases, daily skin tests with the polysaccharide were performed until the patient was discharged from the hospital. In twelve of these cases the reaction became negative before the patients were discharged (seven to nine days), and in twenty-three it remained positive (nine to nineteen days).

In some cases without complications, a positive reaction to the skin test at the time of admission on the sixth or seventh day of the pneumonia enabled us to withhold treatment with the assurance of the presence of sufficient antibodies to cause a crisis with favorable outcome. Not all patients with spontaneous crises, however, have the excess of free antibodies necessary to cause a positive reaction to the test. Some patients with myocardial damage or cardiac decompensation need serum even though they show a positive reaction.

A persistently negative skin reaction appears to have some value from a prognostic standpoint. In most cases in which a positive reaction did not occur after the administration of large amounts of serum the disease terminated fatally. In such cases the blood agglutinins were often found in high titer. A skin formerly reactive to polysaccharide may lose its reactivity, even in the presence of free circulating antibody, when the patient is moribund. A positive reaction in a patient with bacteremia does not mean that no more serum is needed. Dermal injection of pneumococcus polysaccharides into human beings may induce subsequent reactivity of the dermal cells, and this fact is to be borne in mind in studies of skin sensitivity when repeated intradermal injections of these agents are involved.[10]

The polysaccharide skin test is a valuable, though not infallible, means of measuring the serum required for treatment in a given case of pneumococcic pneumonia.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, SECRETARY.

AUGUSTANA MODEL SAFETY GAS OXYGEN APPARATUS ACCEPTABLE

Manufacturer: Safety Gas Machine Company, 1163 Sedgwick Street, Chicago.

This unit is designed for the administration of inhalation anesthesia. It utilizes D cylinders of oxygen, carbon dioxide, nitrous oxide and ethylene, with provision conveniently made for one extra tank of each gas to be attached to the apparatus. In addition, there is an extra yoke provided for the administration of cyclopropane. To each of the sets of yokes (except those for cyclopropane) to which the cylinders are connected is attached a competent reducing valve. The cyclopropane yoke has a pressure gage attached with which the operator may estimate the amount of gas remaining in the cylinder. The units are so designed that different gases cannot leak from one cylinder to another unless the cylinders are connected to the machine in a way other than specified.

There is a central mixing chamber into which gases may be admitted for delivery either singly or in various combinations. A gas is admitted to the mixing chamber through a visible sight-feed in an individual water manometer. All manometers displace against a common head of water. The flow of each gas may be regulated by individual needle valves; thus any desired proportions within reasonable limits may be obtained. There is a by-pass valve as a quick source of supply for oxygen. The manometers are apparently each graduated in gallons per hour.

There is an ether vaporizer attached, which permits the addition of ether vapor to the delivered gas mixture. It is so arranged that the gases may be passed in varying proportions through the ether container by regulation of the valve.

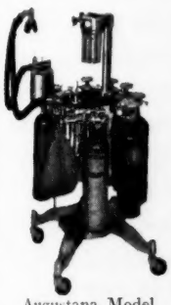
The remainder of the apparatus consists of a typical so-called "circle filter" carbon dioxide absorption unit. The canister containing the soda lime may be shut off from the circuit at will.

An exhalation valve enables the operator to utilize the so-called "open," "semiopen," or "semiclosed" technics of anesthetic administration. The valves are apparently of a rubber fabric material. The rubber tubing and breathing bag appear to be durable. The size of the bags, type of face masks and soda lime mesh are optional.

The apparatus is supported adequately on a pedestal equipped with rubber-tired casters. Even though somewhat large, it is easily wheeled about.

The unit was submitted to a qualified physician, who studied its therapeutic efficiency and applicability. The following was concluded from his report:

There is some resistance to respiration, as in all types of so-called "circle-filter" anesthetic apparatus. This is of the order of 2 to 4 cm. of water with ordinary breathing. While this resistance is of little import in a healthy subject, in the case of a debilitated patient undergoing a long operation it is sometimes of considerable importance. It is common to all models of this type of apparatus of all manufacturers.



Augustana Model Safety Gas Oxygen Apparatus.

When the carbon dioxide absorber is in the breathing circuit, it efficiently removes carbon dioxide. This was proved by actual chemical gas analysis. It was found that 4-8 mesh soda lime produced somewhat less resistance than an 8-14 mesh to breathing and was just as efficient in its removal of carbon dioxide.

A comparatively small breathing bag allows for more flexibility, in that anesthetic mixtures can be changed more rapidly and smaller quantities of gas or vapor are necessary.

The investigators commented that they saw no serious objections to the use of this apparatus. They qualified this statement to this extent: Any skilled anesthetist can give good anesthesia with any piece of apparatus within certain limits. In the last analysis, it is the anesthetist rather than the apparatus that gives the anesthesia.

The Council makes no comment expressed or implied regarding any explosion hazard. It is extremely difficult to determine conditions for such safety.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Augustana Model Safety Gas-Oxygen Apparatus for inclusion in the Council's list of accepted devices.

DUAL-SPECTRUM ULTRAVIOLET LAMP, MODEL 300, ACCEPTABLE

Manufacturer: Bristow and Company, 2831 West Pico Boulevard, Los Angeles.

The Dual-Spectrum Ultraviolet Lamp, Model 300, is a therapeutic lamp designed exclusively for the use of the physician. Evidence was provided to show that 82 per cent of the radiation is between 2,000 and 2,600 angstroms, 16 per cent between 2,600 and 3,000 angstroms and 2 per cent between 3,000 and 3,200 angstroms. The firm claims that, by the use of special glass tubing in addition to quartz tubing, approximately 50 per cent more energy is provided between the bands 2,600 and 3,000 angstroms than is customary with quartz construction.

The lamp consists of a base containing three transformers; a tubular stand supporting the lamp, a time clock, cable attachment, switches and an orificial unit (Council accepted August 1938); and a reflector containing the burner. The weight of the unit is 47 pounds, the outside diameter of the reflector is 36 cm., and the supporting column is adjustable to different heights. An air cushion in the column serves as a shock absorber. The reflector is adjustable horizontally and vertically and may be rotated in both axes.

The reflector, with a bakelite back and an aluminum shell, supports two types of tubing in the burner. One is of quartz and another of a special composition glass which is coiled side by side with the quartz tubing in a flat hexagonal pattern. These tubes contain mercury and a mixture of inert gases and are energized by two transformers made for 50 to 60 cycle current, with 115 volts on the primary and 1,800 volts on the secondary at 90 M.A. Together they consume 180 watts. The orificial transformer has the same specifications on the primary side with 2,000 volts on the secondary at 9 M.A.

The firm submitted evidence regarding the radiation (including two spectrograms), power consumption and other physical data. The lamp was reported to produce the intensity of ultraviolet light in microwatts per square centimeter shown in table 1.

TABLE 1.—*Intensity of Ultraviolet*

	Quartz Light	Special Glass	Both
At 4 inches.....	5,300	2,300	6,200
At 24 inches.....	510	320	640

According to the report of physiologic tests carried out on abdominal untanned skin at 24 inch spacing, the erythema time on this lamp is as given in table 2.

TABLE 2.—*Calculated Minimum Perceptible Erythema Time*

	Seconds
Quartz light	75
Special glass light.....	105
Both	52

The lamp was examined by the Council, and the claims were found to be acceptable from a physical standpoint, and the lamp was determined to be adequate for clinical service.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Dual-Spectrum Ultraviolet Lamp, Model 300, for inclusion in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

AZOCHLORAMID (See New and Nonofficial Remedies, 1939, p. 256).

The following dosage form has been accepted:

Azochloramid Saline Mixture Tablets, 8.5 grains (for preparing 2 ounces of a 1: 3,300 aqueous solution): Each tablet contains azochloramid 0.28 grain, sodium chloride 7.60 grains, disodium phosphate 0.54 grain and monopotassium phosphate 0.08 grain.

BACTERIAL VACCINE MADE FROM THE TYPHOID BACILLUS AND THE PARATYPHOID "A" AND "B" BACILLI (See New and Nonofficial Remedies, 1939, p. 443).

The Gilliland Laboratories, Inc., Marietta, Pa.

Typhoid-Paratyphoid Bacterial Vaccine Immunizing.—Also marketed in 50 cc. vials, twenty immunizing doses containing in each cubic centimeter 1,000 million killed typhoid bacilli, 500 million killed paratyphoid A bacilli and 500 million killed paratyphoid B bacilli.

ANTIMENINGOCOCCIC SERUM (See New and Nonofficial Remedies, 1939, p. 403).

The National Drug Company, Philadelphia.

Antimeningococcic Serum, Refined and Concentrated.—Marketed in packages of two 10 cc. double-end ampule-vials, with gravity outfit and intraspinal and intravenous needles; in packages of one 10 cc. syringe with intravenous needle and one 10 cc. double-end ampule-vial with gravity outfit and intraspinal needle; and in packages of one 20 cc. ampule-vial, with outfit (hospital package). A 1 cc. vial of 1: 10 dilution of the specific serum is included with each package to determine the sensitivity of the patient.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - - Chicago, Ill.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, NOVEMBER 18, 1939

EVOLUTION OF OUR KNOWLEDGE OF TUBERCULOSIS

Subtle, evasive, paradoxical, intricate and complex are terms that apply to the microscopic parasite which a recent writer[1] characterizes as "A Bug Full of Tricks." The early history of devastation wrought by this armored enemy of mankind is still preserved in the distorted joints and spinal columns of prehistoric skeletons and Egyptian mummies. The recent history is accumulating much faster than is the record of many other parasites that revolve about the microscopic or chemical and immunologic analysis.

The code of Hammurabi, written at least 2,000 years B. C., indicates some knowledge then of tuberculosis. Greek writers described the clinical features of tuberculous disease in the fifth century B. C. In the second century Aretaeus not only accurately described the clinical features but suggested routine treatment. In spite of their keen observations, Hippocrates and Galen recognized the hopelessness of a problem that appeared entirely occult. Galen probably never suspected that his own illness was a manifestation of phthisis, for bizarre beliefs befogged the issue. Fracastorius in 1546 expressed the belief that phthisis was due to invisible germs. Paracelsus in 1567 wrote about miners' phthisis. Franciscus Sylvius in 1650 suggested the connection between scrofula and phthisis and that tubercles precede phthisis. The first postmortem report of miliary tuberculosis was given by Manget in 1700, about which time Morgagni refused to perform necropsies on the victims of phthisis because of his fear of contagion.

The tuberculosis death rate reached its highest point about the middle of the eighteenth century, coincident with rapidly increasing facilities for the acquisition of knowledge. Auenbrugger made an epochal contribution in describing immediate percussion in 1761. Late in the eighteenth century Whytt described tuberculous meningitis, and Pott tuberculous destruction of the spine. In 1816 Petit described laryngeal tuberculosis, and Portal suggested a connection between consumption and engorgement of lymphatics. It is said that William Stark, who was studying the pathology of phthisis in London under the renowned John Hunter, died of tuberculosis as the result of a wound received in the morgue. Baillie, the successor of Stark, also developed an infection of the hand after performing a necropsy and died of tuberculosis, but not until his years of study had clarified the knowledge of the tubercle.

At the turn of the nineteenth century Willan discussed the relation of erythema nodosum to tuberculosis. Bichat advanced from the organ pathology of Morgagni to tissue pathology within the organ. Bayle presented in his volume "Pulmonary Phthisis" clinical observations checked by more than 900 necropsies. Corvisart popularized percussion early in the nineteenth century. Later Piorry's method of percussion and Laënnec's new method of auscultation had a profound influence on the progress of physical diagnosis. Laënnec appropriated all previous scientific advances and with remarkable genius drew up a minute history of nearly 400 cases of phthisis before he was 22 years of age. He recorded virtually all that is now taught about the physical diagnosis of diseases of the thorax. He published in 1918 nearly 800 pages on auscultation and diseases of the chest. The advances of the nineteenth century would not have developed so rapidly without the invention of the stethoscope by Laënnec, who himself died of pulmonary tuberculosis. Contemporary with Laënnec, the great clinician Louis, who also suffered from tuberculosis, correlated the symptoms and pathology in the light of the necropsy, and through his teachings and pupils—Oliver Wendell Holmes, George C. Shattuck, William Pepper, Gerhard, Stille, Power, Swett and Clark—he was largely responsible for the establishment of clinical medicine, with special interest in physical examination, throughout the world. Virchow, contemporary with Louis, advanced from tissue pathology to cellular pathology and joined the dualist Schönlein, who coined the word "tuberculosis." At the University of Vienna, Skoda's (1805-1881) skill in diagnosis by means of percussion and auscultation led to the establishment of a special department on chest diseases to which students came from all parts of the world. Skoda's work was brilliantly complemented by his great contemporary Rokitansky, who is said to have performed more than 30,000 postmortem examinations.

A great scientific awakening was imminent by the middle of the nineteenth century. Villemin demonstrated in 1865 in a series of masterly experiments the specific nature of tuberculosis by means of inoculation. Gerlach in 1870 proved that milk from tuberculous cows may convey the disease. Medicine began to move into a new era, which was to see

1. Moorman, Lewis J.: A Bug Full of Tricks, J. Oklahoma M. A. **32**: 204 (June) 1939.

the development of modern laboratory methods. The tubercle bacillus was seemingly preparing a way for its own discovery and for the surrender of many of the secrets of its occult powers. The first pathologic laboratory was established by Virchow in Berlin in 1856 and the first hygienic laboratory by Pettenkofer in 1878. In 1882 Koch discovered the tubercle bacillus. Just before Koch's discovery Trudeau, Dettweiler and others became pioneers in the sanatorium management of patients, and in a short while artificial pneumothorax, another revolutionary method of treatment, was to be introduced by Forlanini.

Four thousand years has been surveyed for this brief statement of evolution of knowledge of this disease. Still from year to year more and more is being written. As the unsolved problems related to the tubercle bacillus remain infinite, so tuberculosis remains the greatest killer of man during the most useful period of his life.

POSTSCARLATINAL NEPHRITIS

Some years ago Burky [1] announced a discovery which many immunologists credited with opening up "so many new broad and inviting possibilities that it is fairly bewildering." [2] He found that lens proteins are nonantigenic when injected into homologous animal species. If the lens substance is mixed with staphylococcus filtrate, however, its latent antigenicity is in some way activated or supplemented, so that it becomes an effective sensitizing or immunizing agent. Rabbits injected with toxin "synergized" or "potentiated" lens protein not only develop antilens precipitins of high titer (e.g. 1:50,000) but also develop degenerative lesions in their own crystalline lens. These lesions duplicate the picture found in human cases of endophthalmitis phaco-anaphylactica. Extending his work to other tissue products, Burky found that in rabbits high titer antibodies could be produced by combining staphylococcus toxin with homologous muscle proteins.

Since the publication of Burky's discovery, many attempts have been made to apply his synergic technic to the production of improved vaccines and antiserums. A few attempts have been made to apply it to the etiology of senescence or degenerative disease. The latest is its application to the etiology of post scarlatinal nephritis.

Lindemann [3] showed that a condition closely simulating glomerular nephritis can be produced in laboratory animals by intravenous injection of heterologous antikidney serum. Animals injected with such cytotoxic serums develop albuminuria, hematuria, cylindruria, oliguria and occasionally anuria. In all these tests, however, the nephrotoxic serum was produced in a foreign animal species. All attempts to develop a nephrotoxic serum by injecting rabbits with homologous kidney material have thus far been unsuccessful. Kidney proteins, apparently, are nonantigenic in the body of the animal of origin.

Applying the Burky technic, however, Schwentker and Comploier,[4] of the Baltimore City Health Department, injected rabbits with rabbit kidney emulsions plus streptococcus or staphylococcus toxin. High titer nephrotoxic serums were produced by both technics. Specific absorption tests showed that the antiserums thus produced contain at least two nephrotoxic antibodies. First there was a relatively high titer complement deviating antibody, specific for kidney parenchyma. This is accompanied by a relatively low titer antibody, which reacts with both kidney and brain emulsions. This second antibody is interpreted by the Baltimore clinicians as presumably specific for the connective tissue elements common to brain and kidney.

Having shown that toxin reinforced emulsions of homologous kidney are antigenic in rabbits, the Baltimore clinicians attempted to determine whether or not specific nephrotoxic antibodies are developed in the human body during the course of streptococcic infections. Complement fixation tests were therefore made with the serums of forty patients in various stages of scarlet fever, with twenty-nine control tests on patients without any sign of streptococcic infection. Thirty-seven (92 per cent) of the scarlet fever patients gave positive nephrotoxic serum reactions, as contrasted with but three (10 per cent) of the control patients. These results indicate that most persons suffering from scarlet fever develop circulating antibodies against their own kidney tissues, a reaction rarely seen in normal persons and then presumably due to unrecognized staphylococcic or streptococcic infection.

From these data Schwentker and Comploier conclude that streptococcus toxin damages some of the kidney tissue during the primary infection in scarlet fever. This damage may be clinically insignificant. The denatured kidney proteins thus formed, however, are released, "activated" or "potentiated" to "complete" antigens, stimulating the production of antibodies specific for kidney tissue. These antibodies may be of sufficiently high titer to give rise to acute hemorrhagic nephritis. A similar immunologic vicious circle had been previously proposed by Schwentker [5] to explain the etiology of postinfectious encephalomyelitis. The clinical and pathologic picture of encephalomyelitis is readily produced in monkeys by repeated injections with partially denatured brain emulsions. If the Schwentker theory of the etiology of postscarlatinal nephritis is confirmed, the development of a logical method of interrupting or preventing the nephrotoxic immunologic vicious circle should not be beyond ingenuity.

1. Burky, E. L.: J. Allergy **5**: 466 (July) 1934.
2. Cooke, R. A.: J. Allergy **5**: 473 (July) 1934.
3. Lindemann, W.: Ann. Inst. Pasteur **14**: 49, 1900.
4. Schwentker, F. F., and Comploier, F. C.: J. Exper. Med. **70**: 233 (Sept.) 1939.
5. Schwentker, F. F., and Rivers, T. M.: J. Exper. Med. **60**: 559, 1934; **61**: 689, 1935.

COMBINED (ACTIVE-PASSIVE) DIPHTHERIA PROPHYLAXIS

Fifteen years ago Ramon and Lafaille [1] suggested a new method of prophylaxis against diphtheria. By this improved method the transient passive immunity caused by injecting antitoxic serum is supplemented by a semipermanent active immunity caused by the simultaneous injection of diphtheria toxoid. A number of European investigators confirmed the theoretical possibility of such combined immunization in laboratory animals. Gundel and König,[2] for example, found that by a proper selection of dosage and type of antiserum and of toxoid a relatively permanent active immunity could be superimposed on the transient passive immunity in rabbits. This combined immunity was sufficient to protect laboratory animals from diphtheria toxin over a long period. The only question undetermined by their work was whether or not a similar duplex immunization was possible or feasible in man.

Now the clinical feasibility of this combined technic is denied by Paschlau [3] and by Frey and Schmid,[4] of the Red Cross Hospital, Vienna. They injected 2,000 units of antidiphtheritic horse serum, cow serum or sheep serum intramuscularly into each of twenty children, followed by single or multiple subcutaneous injection with diphtheria toxoid. Alum toxoid was used in most of the tests. The degree of combined active-passive immunity was estimated in these children by periodic titrations of the blood serum.

As a typical example of their data, the antitoxin titer rose to 1.75 units per cubic centimeter of the patient's blood by the third day after the duplex injection. This titer then fell to 0.4, 0.2 and 0.1 unit respectively by the end of seven, fourteen and twenty-one days. On the twenty-eighth day only a trace of the passively transferred antitoxin was detectable, which trace completely disappeared by the forty-fifth day. Active immunity was not demonstrable. Control patients injected with toxoid alone developed relatively high antitoxic titers.

Under the conditions of their test, therefore, the toxoid was not only an ineffective immunizing agent but apparently had the deleterious effect of hastening the elimination or destruction of the transferred antitoxin. Their general conclusion is that combined active-passive immunization is not feasible in human medicine, the two types of immunization being incompatible with each other. This conclusion was dramatically confirmed by one of their patients, who contracted diphtheria during the course of their attempted duplex immunization. Whether or not a combined active-passive immunity is possible or feasible in specific infections other than diphtheria was not tested by the Austrian clinicians.

1. Ramon, Gaston, and Lafaille, André: Compt. rend. Soc. de biol. **93:** 582 (Aug. 14) 1925. Ramon, Gaston: Ann. Inst. Pasteur **42:** 959 (Sept.) 1928.
2. Gundel, M., and König, F.: Ztschr. f. Immunitätsforsch. u. exper. therap. **92:** 235 (Feb. 18) 1938.
3. Paschlau, Günther: Klin. Wchnschr. **18:** 7 (Jan. 7), 60 (Jan. 14) 1939.
4. Frey, Leopold, and Schmid, Eddehard: Ztschr. f. Immunitätsforsch. u. exper. Therap. **95:** 486 (June) 1939.

Current Comment

THE CHRISTMAS SEAL

Two hundred thousand persons are alive in the United States today who would have been dead of tuberculosis if last year had been 1904. Since that year, which marked the inception of the National Tuberculosis Association, the mortality rate from this disease has been cut down from 201 deaths per hundred thousand of population to 49 in 1938. People are now being urged to buy Christmas Seals, which help to finance the work of this association and its 2,500 affiliated organizations in all parts of the country. A part of the money derived from the sale of these seals goes into a fund which maintains a rehabilitation program for tuberculous persons in sanatoriums. But the real problem in fighting tuberculosis involves education: Those who have tuberculosis in its incipient stages can be cured if they are aware of their disease. In order to find these early cases, the people must be educated to look for it. In spite of the improvement of diagnostic methods, only 13 per cent of patients admitted to sanatoriums are found to be in the early stages of the disease, thus showing that there are far too many with unrecognized cases in the community infecting their families and neighbors. Only by finding every single case can the disease be eliminated. Early examination, skilful diagnosis and prompt treatment are the factors that make tuberculosis curable and preventable. Persons with questionable cases should be promptly examined.

TESTIMONIALS OF THE DEPARTED FOR VALENTINE'S MEAT JUICE

An early report of the Council on Pharmacy and Chemistry (1909) pointed out that Valentine's Meat Juice was being promoted with fallacious claims that it is highly nutritious and is valuable in the treatment of pneumonia, diphtheria and typhoid. Such claims are no longer made. Recently physicians have received a letter referring to an accompanying booklet containing the "experience of Physicians who have, themselves, suffered from Gastric and Intestinal troubles and found Valentine's Meat-Juice of much comfort and satisfaction." Of the testimonials (twenty-one in number) eleven were from abroad. Of those supposed to have been given in the United States, it is interesting to note the following testimony of Dr. C.:

> "Having had a very long and exhausting attack of Typhoid Fever, lasting from June until the following December, VALENTINE'S MEAT-JUICE was the only article of nourishment I could take and the only one I required. Yet long before my illness I had prescribed it in my practice in every variety of medical and surgical diseases coming under the care of a busy practitioner. I have never yet met with a case from Infantile life to Old Age that VALENTINE'S MEAT JUICE could not be given with the greatest advantage."

According to the records of the A. M. A. Directory, Dr. C. died ten years ago. The next testimony by a physician in America is Dr. M., who died in 1907. Dr. S. died in 1930. Dr. G., according to our records, graduated in 1885, but the American Medical Directory has lost all contact with him. Dr. K. died in 1929;

Dr. S. died in 1913; Dr. P. died in 1936. The American Medical Directory has no record of Dr. C. R. T. but it does have a record of Dr. E. R. T., in the same town, who died in 1919. Of Dr. T. L. P. it has no record; there is a doctor from the same town with a similar name who died in 1915. Dr. L. is not a member or Fellow of the American Medical Association but is apparently still living. In other words, only one doctor of the entire group of American physicians whose testimonials are offered by the Valentine's Meat Juice Company in the year 1939 is alive. The title of the booklet is "Report From Members of the Medical Profession Who Have Themselves Taken Valentine's Meat-Juice When Ill With Gastric or Intestinal Trouble." And now they are no longer ill; they are dead. But their testimonials linger on!

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Society News.—The Etowah County Medical Society was addressed in Gadsden recently by Drs. James O. Finney and Amos C. Gipson on "Complications of Peptic Ulcers" and "Immunization and Treatment of Acute Infectious Diseases" respectively.——At a meeting of the Calhoun County Medical Society, Anniston, recently the speakers were Drs. James A. Ward on "Obesity Associated with Endocrine Disturbances" and Hugh M. C. Linder on "Empyema Thoracis with Special Reference to the Chronic Stage." Both are from Birmingham. ——Dr. John Ralph Morgan, Birmingham, discussed "The Treatment of Burns" before the Walker County Medical Society October 13 in Jasper.

ARIZONA

New Office for State Society.—The Arizona State Medical Association has opened offices at 202 Security Building, Phoenix, and employed Mrs. Kitty Ives Coleman as executive secretary. For the past three and a half years the association has had a part time assistant in a combined office with the Maricopa County Medical Society and library. The president of the association held a conference of presidents and secretaries of the county medical societies at Phoenix October 22 to discuss the program of the association for the current year.

ARKANSAS

Society News.—The Ouachita County Medical Society was addressed in Camden recently by Drs. James E. Knighton Jr. on "Some Problems in Cardiology"; James C. Willis Jr. and Willis J. Taylor, "Partial Gastrectomy," and Oscar O. Jones, "Treatment of Bursitis." All are from Shreveport.

University News.—The general offices of the University of Arkansas School of Medicine, Little Rock, were moved recently to the former home of the late Dr. Carle E. Bentley, which is adjacent to the school. This property was acquired through purchase several months ago, newspapers report. Space in the medical school occupied by offices since its construction will be converted into additional quarters for the library.

CALIFORNIA

Alumni Day.—The University of California Medical School will observe its alumni day November 24. The program will consist of clinics and fracture and medical ward rounds at San Francisco Hospital. During the operations, the preoperative and postoperative care and surgical methods will be discussed by a member of the staff. There will be also a program of entertainment, according to an announcement from the university.

DISTRICT OF COLUMBIA

Personal.—Robert E. Bondy, director of disaster relief of the American Red Cross, has been appointed director of public welfare of the District.——Rear Admiral Perceval S. Rossiter, U. S. N., retired, formerly surgeon general of the navy, became September 19 chief of staff at Gallinger Hospital.

The Davidson Lecture.—Dr. Walter Freeman, professor of neurology at George Washington University School of Medicine, recently presented the Davidson Lecture before the Medical Society of the District of Columbia. His subject was "The Surgery of Mental Disorder." The lecture is given biennially and is named for Dr. Edward Young Davidson. The lecturer is chosen through essays submitted on a competitive basis.

Portrait of Dr. White.—A portrait of the late Dr. William Alanson White, for many years superintendent of St. Elizabeths Hospital and professor of psychiatry at George Washington University School of Medicine, was presented to the university in behalf of the medical faculty at the opening exercises of the school September 25. Dr. Charles S. White made the presentation and Mrs. Joshua Evans Jr. accepted it for the university in behalf of the board of trustees.

FLORIDA

Personal.—Dr. Luis Garcia will be director of a new tuberculosis hospital which was to be opened about October 10 on the site of the former Pine Health tuberculosis preventorium, Tampa newspapers reported. The hospital was made possible by the cooperation of the city and county with the aid of charitable organizations. Dr. Garcia has been in charge of the Tampa tuberculosis clinic since it was opened about two years ago.——Dr. William McQueen, Sarasota, has been appointed superintendent of the Sarasota Hospital.

District Meetings.—The third annual meeting of the Southeast Medical District of the Florida Medical Association was held at West Palm Beach October 12, with headquarters at the Palm Beach Yacht Club. The speakers included Drs. Eugene C. Chamberlain, Fort Lauderdale, on "Isolated Myocarditis"; Hillard W. Willis, Miami, "Nephritis in Children"; George D. Lilly, Miami, "Surgical Treatment of Essential Hypertension," and Carlos A. P. Lamar, Miami, "Clinical Endocrinology of the Male, with Especial Reference to the Male Climacteric."——The North Central Medical District Society held its third annual meeting in Ocala October 26 at the Marion Hotel. Dr. Carl S. Lytle, Dunnellon, president of the Marion County Medical Society, gave the address of welcome. Among other speakers were Drs. Ralph E. Russell, Ocala, on "Hygiene of the Eyes"; Laurie J. Arnold Jr., Lake City, "Cervical Ribs"; Richard C. Cumming, Ocala, "A Young Doctor Looks at Socialized Medicine," and Walter E. Murphree, Raiford, syphilis.

ILLINOIS

Personal.—Dr. Otto L. Bettag, White Haven, Pa., has been appointed superintendent of the Livingston County Sanatorium, Pontiac, succeeding Dr. Julius B. Stokes, resigned.

Outbreak of Typhoid.—Twelve cases of typhoid with one death occurred at DePue, Bureau County, during September, according to the *Illinois Health Messenger*. The outbreak was ascribed to a raw milk supply used by all the patients. When the supply was cut off as a control measure the epidemic ended, the *Messenger* said.

Chicago

Dr. DeLee Observes Seventieth Birthday.—Dr. Joseph B. DeLee, professor emeritus of obstetrics and gynecology, the School of Medicine of the Division of Biological Sciences, University of Chicago, observed his seventieth birthday October 29 at a party planned to benefit the Chicago Maternity Center, which he founded. He was presented with cuff links forged from a pair of forceps which he used in his early days of practice. They were the gift of the staff of the center and were presented by Dr. Beatrice E. Tucker, who directs the institution.

IOWA

Obstetric Service in the Home.—A plan is under way to provide home obstetric service to indigent patients in Polk County. The program is to be financed by funds from the state department of health and cooperating groups are the state department of health, State University of Iowa College of Medicine, Polk County board of supervisors, the city health department, public health nursing association, Polk County Emergency Relief Administration, Broadlawns Hospital, the intern committee, the superintendents of the private hospitals

and the Polk County Medical Society. The objectives are to afford obstetric service in the homes of indigent patients; to enable the college of medicine to participate in such a service and use the opportunities for teaching; to afford an opportunity for interns connected with the various accredited Des Moines private hospitals to participate in the service and to reduce the number of obstetric patients in Broadlawns Hospital, making the beds available to the more complicated and serious types of cases in which hospitalization is imperative. The home service will operate through the outpatient department at Broadlawns and patients will be investigated and arrangements made by the social service department, according to the *Bulletin* of the Des Moines Academy of Medicine and the Polk County Medical Society.

KANSAS

Changes in Health Officers.—Dr. Cyril V. Black, Pratt, has been appointed health officer of Pratt, filling the unexpired term of the late Dr. Charles E. Phillips.——Dr. Edwin O. Squire has been appointed health officer for the Coffeyville board of health.

Library and Museum of Medical History.—Space has been provided in the Hixon Laboratory of the University of Kansas School of Medicine, Kansas City, for a new library and museum of medical history. Dr. Logan Clendening, who has been conducting a course in medical history at the university for many years, gave his collection of medical curiosities and his historical library as a nucleus for the new department. The building housing the laboratory was financed by the Hixon Foundation, the PWA and gifts from Mrs. Clendening, it was stated.

KENTUCKY

Poliomyelitis in Mountain Counties.—Fifty-five cases of poliomyelitis have been reported in Floyd County and additional cases in adjoining counties, newspapers reported November 2. Most of the cases were in rural areas. The state health department and the Kentucky Crippled Children's Commission are investigating the epidemic with a view to preventing spread of the disease and instituting treatment for those stricken. Ten cases were reported in Pike County, eight in Johnson and three in Lawrence.

LOUISIANA

Society News.—At the October meeting of the Tri-Parish Medical Association, comprised of the parishes of East and West Carroll, Tensas and Madison, Dr. William K. Purks, Vicksburg, Miss., spoke on allergy.——The Eighth District Medical Society was addressed in Alexandria October 11 by Drs. Conley H. Sanford, Memphis, Tenn., on "Kidney Diseases and Hypertension"; Donovan C. Browne, New Orleans, "Functional Colitis," and Edwin J. Kepler, Rochester, Minn., "Obesity—An Endocrine Problem."

Postgraduate Instruction.—Members of the staff of Louisiana State University Medical Center, New Orleans, are cooperating in a series of postgraduate courses being given by the division of maternal welfare of the state board of health, the federal government and the state medical society. In October Drs. Rupert E. Arnell and William F. Guerriero, clinical professor of obstetrics and gynecology and instructor in obstetrics and gynecology respectively, gave postgraduate instruction to practicing physicians in northern Louisiana. Other members of the staff later will conduct similar courses in various subjects.

MASSACHUSETTS

Public Health Meeting.—The annual meeting of the Massachusetts Public Health Association was held in Boston October 26. The program was divided into sections with a symposium making up the board of health section; the speakers were Dr. John E. Gordon, Arthur D. Weston, C.E., and Sophie C. Nelson, R.N. In the laboratory section the speakers were Donald L. Augustine, Sc.D., on "Trichinosis"; William C. Boyd, Ph.D., "Uses of Blood Grouping," and Dr. Frank E. Barton, Boston, "Use of Placental Blood for Transfusions." The child health section devoted its session to a discussion of "The Child: The Influence of Economic Factors."

Society News.—At a special meeting of the New England Heart Association in Boston October 30 Dr. Harry E. Ungerleider and Mr. James D. Ewing, Equitable Life Assurance Society, New York, discussed "Insurance Frauds and Disability Problems in Heart Disease."——The New England Pathological Society was addressed in Boston October 19 by Drs. Lorne M. Gray, Toronto, Ont., "Fat Embolism"; Charles E. Dunlap on "Effect of Radiation on the Blood" and Shields Warren, "Significance of Chronic Mastitis as a Precancerous Lesion."——Dr. Vincent Gerard Ryan, who holds a fellowship in the Austen Riggs Foundation under a grant from the John and Mary R. Markle Foundation, discussed certain aspects of cases falling in the neurotic-psychotic borderline before the medical advisory board of the foundation at its annual meeting in Stockbridge October 21. Dr. Austen Fox Riggs presided at the meeting. The paper was discussed by Drs. Adolf Meyer, Baltimore; Charles Macfie Campbell and Stanley Cobb, Boston; Earl D. Bond and Kenneth E. Appel, Philadelphia, and Arthur H. Ruggles, Providence, R. I., among others.

MICHIGAN

Society News.—Dr. Carl V. Weller, Ann Arbor, gave an address before the Ingham County Medical Society October 17 entitled "Shifting Points of View in Regard to Cancer."——Dr. Harold Henderson, Detroit, addressed the Jackson County Medical Society in Jackson October 17. His subject was "The Middle Aged Woman."——Dr. Francis Bruce Fralick, Ann Arbor, discussed "Ophthalmology and Its Relation to General Health" before the Kalamazoo Academy of Medicine, Kalamazoo, October 17.

Highland Park Physicians' Club.—The fourteenth annual clinic of the Highland Park Physicians' Club was held November 15 at the Highland Park General Hospital. The program opened with a clinical pathologic conference by Dr. Edgar H. Norris, professor of pathology, Wayne University College of Medicine, Detroit. Others on the program were:

Dr. Sumner L. S. Koch, Chicago, Infections of the Hand.
Dr. Edward J. Stieglitz, Garret Park, Md., Treatment of Hypertensive Disease from an Internist's Viewpoint.
Dr. Alfred W. Adson, Rochester, Minn., Treatment of Essential Hypertension by Extensive Sympathectomy.
Dr. Edward L. Cornell, Chicago, Analgesia and Anesthesia in Obstetrics.
Dr. Allen Graham, Cleveland, Diagnostic Criteria of Cancer.
Dr. Temple S. Fay, Philadelphia, Temperature Factors in Cancer and Embryonal Cell Growth.

Medical Service for the Low Income Group.—Michigan Medical Service, a nonprofit corporation for group medical care organized under special enabling legislation sponsored by the Michigan State Medical Society, is now ready to assist the low income group in Michigan to obtain the services of doctors of medicine in return for small monthly subscription payments. The plan will be administered by a board of directors consisting of from eleven to thirty-five representatives of the public and the medical profession. Local advisory committees will be established by the medical profession so that professional judgment will guide the relations with physicians concerning participation, fees and the rendering of services. According to the November state medical journal, the articles of incorporation of Michigan Medical Service have been certified by the attorney general and the necessary working capital has been advanced by the Michigan State Medical Society. The plan will go into effect in the near future and its operation will be under the direct supervision of the state insurance department. All employed persons under the age of 65 who can be enrolled in groups of twenty-five or more will be eligible for membership.

MINNESOTA

Study of Motor Accidents.—The Minnesota State Medical Association has appointed four physicians to conduct a study of motor vehicle accidents. Drs. Kano Ikeda, St. Paul; Maurice B. Visscher, Minneapolis; Dale D. Turnacliff, Minneapolis, and Edward W. Ostergren, St. Paul.

Society News.—Included among the speakers before the Hennepin County Medical Society, Minneapolis, November 6, was Dr. Horace M. Korns, Iowa City, on "Arterial Hypotension."——The Scott-Carver Medical Society was addressed October 10 in Shakopee by Drs. Arthur C. Kerkhof and O. L. Norman Nelson, both of Minneapolis, on "New Aspects of Endoscopy" and "Problems of Pernicious Anemia" respectively.

Minnesota Medical Foundation.—The establishment of the Minnesota Medical Foundation at the University of Minnesota, Minneapolis, was announced at a dinner October 13 commemorating the fiftieth anniversary of the founding of the school of medicine. The foundation has been set up by alumni of the university to establish scholarships, professorships, lectureships, research and aid to worthy students. According to the Minneapolis *Tribune*, the foundation will have the power to receive gifts, endowments, the rights to patents, trusts and property to carry out its aims. Funds derived from these sources will be used exclusively to assist university authori-

ties in improving and enlarging the scope of their activities in medicine. Dr. Erling S. Platou, Minneapolis, president of the Minnesota General Alumni Association, is chairman of the foundation.

MISSISSIPPI

Society News.—At a meeting of the Central Medical Society in Whitfield October 3 the speakers included Drs. Ellyson G. Meriwether on "Modern Psychiatry at the Descriptive Level"; Willard L. Waldron, "Psychosis with Pellagra; Preliminary Reports of Intraspinal Treatment with Synthetic Vitamin B_1"; Victor D. Thomas, "Differential Diagnosis Between Paranoid Condition and Dementia Praecox, Paranoid Type"; Clarence H. Denser, "Some Aspects of Metrazol Therapy," and Frank A. Donaldson and F. M. Clarke, Ph.D., "Fever Therapy in Central Nervous System Syphilis."

MISSOURI

Dr. Willard Allen Appointed to Washington University.—Dr. Willard M. Allen, assistant professor of obstetrics and gynecology, University of Rochester School of Medicine, Rochester, N. Y., has been appointed professor and chairman of the department of obstetrics and gynecology at Washington University School of Medicine, St. Louis. Dr. Allen graduated at Rochester in 1932. In 1935 he won the $1,000 Eli Lilly Award of the American Chemical Society for distinguished research in biochemistry.

NEBRASKA

Postgraduate Course in Obstetrics and Pediatrics.—A postgraduate circuit course in obstetrics and pediatrics is being presented in five towns under the auspices of the committee on maternal and child health of the Nebraska State Medical Association and the division of maternal and child health of the state health department. The series began November 6 and will continue till December 2. The lecturers, who will conduct clinics during the day and give formal lectures at night, will be Drs. Morris Edward Davis, Chicago, the first two weeks, and Henry C. Hesseltine, Chicago, the last two. Dr. Harry A. Towsley, Ann Arbor, Mich., will be the guest pediatrician. The towns in which the courses are being held are Grand Island, McCook, North Platte, Scottsbluff and Chadron.

Society News.—Dr. Elliott P. Joslin, Boston, addressed the Lancaster County Medical Society, Lincoln, October 4 on diabetes.——Drs. James Dewey Bisgard and Frank Lowell Dunn, Omaha, addressed the Madison Six County Medical Society, Norfolk, recently on "Treatment of Nontuberculous Suppurative Diseases of the Chest" and "Treatment of Pneumonia" respectively.——At a recent meeting of the Southwestern Nebraska Medical Society in McCook the speakers, all of Denver, were Drs. Edgar W. Barber on "Medical and Surgical Treatment of Goiter"; Wilfred W. Barber, "Sulfanilamide and Sulfapyridine," and Albert W. Metcalf, who showed color films on "Vascular Diseases of the Extremities."——Dr. Harry L. Alexander, St. Louis, discussed "The Newer Aspects of Allergy" before the Omaha-Douglas County Medical Society October 10; Dr. Maurice C. Howard presented a case report on intractable asthma.

NEW YORK

Clinical Day in Buffalo.—The Buffalo Academy of Medicine held its annual clinical day November 8 at the Hotel Statler. The scientific speakers were Drs. Emil Novak, Baltimore, on "Rational Management of the Menopause"; Donald W. Gordon Murray, Toronto, "Heparin in Thrombosis"; Charles C. Higgins, Cleveland, "Prevention of Recurrent Renal Calculus" and Russell L. Haden, Cleveland, "The Problem of Osteoarthritis." Mr. Isaac F. Marcosson, New York, was the after-dinner speaker on "War and World Chaos."

County Society Offers Health Education Service.—The Medical Society of the County of Westchester has recently made available to parent-teacher groups, service clubs, women's clubs and other lay groups a new series of educational programs. The society will prepare each month a health talk, of which copies will be sent to organizations desiring them. In addition speakers will be available through the society's speakers' bureau for more extended discussions. The society also plans active solicitation of speaking dates for members who have volunteered to speak on a wide variety of health subjects. The entire program on health education will be offered as a public service without cost to the lay groups. Dr. Edward H. Marsh, White Plains, is chairman of the public health committee which arranged the new plan.

New York City

District Meeting.—The First District Branch of the Medical Society of the State of New York held its annual meeting at the Presbyterian Hospital October 11. There were clinics on general surgery, neurosurgery, obstetrics and gynecology, general medicine, pediatrics, ophthalmology, urology and radiotherapy. Among other features was a symposium on fractures and traumatic lesions presented by Drs. William Darrach, Stephen S. Hudack, Fred M. Smith, Barbara B. Stimson, Clay Ray Murray and Harrison L. McLaughlin.

New Tuberculosis Hospital.—Mayor La Guardia laid the cornerstone of the new Triboro Hospital for Tuberculosis on Grand Central Parkway, Queens, September 28. The new hospital, scheduled for completion in April 1940, will be nine stories high. It will have a capacity of 550 beds, divided mainly into six-bed wards occupying the third to the seventh floors. All floors will have solariums, and wide use is to be made of glass, notably in partitions between wards and in the large number of outside windows. The building is financed by a city appropriation of $1,850,569 and a PWA grant of $1,649,431.

Annual Plastic Surgery Meeting.—The eighth annual meeting of the Society of Plastic and Reconstructive Surgery was held in New York October 27-28. Features of the program included a symposium on skin grafting by Drs. James Barrett Brown, St. Louis, and Edward A. Kitlowski, Baltimore, a session of motion picture films and clinics Saturday morning. Papers were presented by Drs. Gustave Aufricht on "Details and Technical Hints on Rhinoplasty"; Adalbert G. Bettman, Portland, Ore., "Rebuilding the Alveolar Process and the Buccal Sulcus"; Jacques W. Maliniac, "Blood Supply of the Breast," and Leon E. Sutton, Syracuse, N. Y., "The Use of Tubed Flaps for the Study of Healing in Human Skin."

NORTH CAROLINA

Health Education Project.—Stanley County has been chosen by the state board of health and the state board of education for a project in health education in public schools, the first of a program to be financed by a $50,000 grant from the Rockefeller Foundation. The program is designed to bring about closer cooperation between the departments of health and education and will provide classroom training for pupils in hygiene and related subjects, physical education, medical supervision from the point of view of health promotion and disease prevention, and training in home, school and community sanitation. Dr. John F. Kendrick, Raleigh, has been assigned temporarily by the International Health Division of the Rockefeller Foundation to direct the project.

District Meetings.—The annual meeting of the Sixth Councilor District of the Medical Society of North Carolina was held September 21 in Durham. The speakers included Drs. Oren Moore, Charlotte, on "The Problem of Abortion"; Charles R. Bugg, Raleigh, "Acute Contagious Diseases of Childhood," and William M. Nicholson, Durham, "Management of the Ambulatory Diabetic."——The Ninth District Medical Society held its annual meeting in Morganton September 28 with the following speakers: Drs. Roy H. Long, Morganton, on "Metrazol in the Treatment of Mental Disease"; James W. Davis, Statesville, "Treatment of Fractures of the Hip Joint"; Samuel M. Bittinger, Black Mountain, "Surgical Treatment of Tuberculosis"; Thomas D. Sparrow, Charlotte, "Rationale of the Treatment of Goiter," and Robert A. Ross, Durham, "Problems of Late Toxemia of Pregnancy." Dr. James W. Vernon, Morganton, paid tribute to the memory of the late Dr. Edward W. Phifer, Morganton, and Dr. James K. Hall, Richmond, gave an address entitled "What Moves Man."

OHIO

Society's Lecture Program.—The Mahoning County Medical Society presented its fall lecture program October 9-11 with Dr. Charles F. Geschickter, Baltimore, as the speaker. Dr. Geschickter dealt with lesions of the skin and oral cavity, the bone, soft parts, gastrointestinal tract, thoracic cavity and the breast.

Society News.—Dr. Austin A. Hayden, Chicago, addressed the Cincinnati Academy of Otolaryngology October 23 on "Otologists, Hearing Aids and Leagues for the Hard of Hearing."——Dr. Albert M. Snell, Rochester, Minn., addressed the Montgomery County Medical Society, Dayton, November 17 on "Treatment of Liver Disease with Special Reference to the Hemorrhagic Diathesis."

OKLAHOMA

Regional Meeting.—The Southeastern Oklahoma Medical Association held a meeting in Poteau October 24. The following speakers were on the program:

Dr. Orville M. Woodson, Poteau, Nephroptosis.
Dr. Sidney J. Wolfermann, Fort Smith, Ark., Diagnosis of Location of Intestinal Obstruction.
Dr. Leonard S. Willour, McAlester, Fractures of the Pelvis and Upper End of the Femur.
Dr. Coyne H. Campbell, Oklahoma City, Hysteria.
Dr. Charles T. Chamberlain, Fort Smith, Vitamin Deficiency Diseases.
Dr. Paul Neeson Rolle, Poteau, Artificial Feeding of Infants.

Annual Railway Physicians' Meeting.—The thirty-eighth annual meeting of the Frisco System Medical Association was held at Tulsa, October 23-24. Among the speakers were:

Dr. William G. Norman, Cherryvale, Kan., Economic Problems of Modern Medical Practice.
Dr. Harry B. Davis, Kansas City, Mo., Ocular Conditions Encountered by the Railroad Surgeon.
Dr. Edward H. Cary, Dallas, Texas, The Use of Old Tuberculin in the Diseases of the Eye.
Dr. William S. Horn, Fort Worth, Texas, Chronic Brucellosis as a Major Cause of Neurasthenia.
Dr. Robert M. Howard, Oklahoma City, Toxic Goiter.
Dr. Cyrus E. Burford, St. Louis, Injuries by External Force to Kidney, Bladder and Urethra.

PENNSYLVANIA

State to Distribute Serum and Sulfapyridine for Pneumonia.—The state department of health recently designated pneumonia control centers throughout the state from which sulfapyridine and a certain amount of serum are to be distributed free at the request of physicians for patients who are not in a position to purchase them. The centers are also equipped to give rapid and accurate bacteriologic diagnosis. Clinical reports on the results of therapy on forms supplied by the state health department are required from each physician who uses sulfapyridine or serum supplied by the department.

Society News.—Dr. Henry J. John, Cleveland, addressed the Washington County Medical Society, Washington, November 8 on diabetes.——Dr. Charles Howard Marcy, Pittsburgh, addressed the Fayette County Medical Society, Uniontown, November 2 on pulmonary hemorrhage.——Dr. Henry L. Bockus, Philadelphia, addressed the Delaware County Medical Society, Chester, November 9 on chronic gastritis.——Dr. Katharine O'Shea Elsom, Philadelphia, addressed the Dauphin County Medical Society, Harrisburg, October 10 on "Nutritional Disturbances Incident to Vitamin B Deficiency."——Dr. Henry K. Mohler, Philadelphia, addressed the Harrisburg Academy of Medicine October 17 on "Therapeutic Uses of Sulfanilamide and Its Associated Compounds."

TENNESSEE

Clinical Congress in Chattanooga.—The Chattanooga and Hamilton County Medical Society held its annual clinical congress October 26 at Newell Sanitarium and Erlanger Hospital. Dr. Julius C. Brooks was in charge of surgical clinics and Dr. James D. L. McPheeters in charge of medical clinics. Guest speakers at a banquet in the evening were Drs. James E. Paullin, Atlanta, Ga., on "Treatment of Congestive Heart Failure" and William H. Stewart and Charles W. Breimer, New York, on "Cineroentgenography of Today."

Society News.—Dr. Robert R. Brown addressed the Nashville Academy of Medicine and the Davidson County Medical Society October 31 on "Internal Derangements of the Knee Joints" and Dr. William C. Dixon November 7 on "Treatment of Uterine Prolapse."——Drs. Jefferson A. Hanna and William C. Chaney, Memphis, among others, addressed the Dyer, Lake and Crockett Counties Medical Society October 4 on "The Present Conception of Vitamin Therapy" and "More Recent Advances in the Treatment of Migraine" respectively.——Dr. Stewart Lawwill, Chattanooga, addressed the Chattanooga and Hamilton County Medical Society November 2 on "Intracapsular Cataract Extraction."

TEXAS

South Texas Postgraduate Meeting.—The eighth annual Postgraduate Medical Assembly of South Texas will be held in Houston December 5-7 at the Rice Hotel. The lecturers will be Drs. George G. Ornstein, Eliot Bishop, Herbert F. Traut, James W. White and Rupert Franklin Carter, New York; Henry H. Turner, Oklahoma City; Frank R. Ober, Boston; Grady E. Clay and Edgar G. Ballenger, Atlanta, Ga.; Perry G. Goldsmith, Toronto, Canada; Harold I. Lillie, Rochester, Minn.; Archibald L. Hoyne, Chicago; Hans H. F. Reese, Madison, Wis., and Isaac A. Bigger, Richmond, Va.

UTAH

State Medical Election.—Dr. Alfred C. Callister, Salt Lake City, was chosen president-elect of the Utah State Medical Association at the meeting of the house of delegates during the Rocky Mountain Medical Conference in Salt Lake City in September. Dr. George M. Fister, Ogden, became president and the following vice presidents were elected: Drs. Edwin M. Neher, Salt Lake City; Wilford J. Reichmann, St. George, and David E. Ostler, Richfield. The 1940 meeting will be in Ogden.

VERMONT

Dispensary Enlarged.—The Burlington Free Dispensary, operated jointly by the University of Vermont College of Medicine and the city of Burlington, marked the twenty-fifth anniversary of its founding by opening new and enlarged quarters. The university rented and remodeled a building and will pay the rent and maintenance, while the city contributes $5,000 for expenses and a part of the salary of the director. The dispensary is the teaching outpatient clinic for the medical school. The new facilities include a laboratory and diagnostic appliances. In addition it is planned to add new clinics in psychiatry and venereal disease. The dispensary occupies two floors of its new building, one floor is leased to relief agencies and the upper floor has rooms for students who are on twenty-four hour duty. Dr. Jesse A. Rust Jr. is city physician and director of the dispensary.

VIRGINIA

Special Society Elections.—Several societies of specialists held their annual meetings in Richmond during the recent annual meeting of the Medical Society of Virginia. The Virginia Urological Society elected the following officers: Drs. Albert A. Creecy, Newport News, president; Samuel Beverly Cary, Roanoke, vice president, and Linwood D. Keyser, Roanoke, secretary. New officers of the Virginia Radiological Society are Drs. Fred M. Hodges, Richmond, president; Daniel D. Talley Jr., Richmond, vice president, and Vincent W. Archer, Charlottesville, secretary. The Virginia Pediatric Society elected Drs. Samuel A. Anderson Jr., Richmond, president; James V. Bickford Jr., Norfolk, vice president, and John M. Bishop, Roanoke, secretary, reelected. Dr. Harry Hudnall Ware Jr., Richmond, was elected president of the Virginia Obstetrical and Gynecological Society and Dr. Henry C. Spalding, Richmond, secretary.

WISCONSIN

Fiftieth Anniversary of County Medical Society.—The Douglas County Medical Society celebrated its fiftieth anniversary at a meeting in Superior October 4 with Dr. John Baird, the only surviving charter member, as the guest of honor. Dr. Fred G. Johnson, Iron River, councilor of the eleventh district, and several colleagues paid tribute to Dr. Baird, and the society presented to him a gold medal in recognition of his services to the society, the community and the medical profession. A volume on the history of the society, prepared by Mrs. Loran W. Beebe, Superior, was presented by the woman's auxiliary.

Society News.—Dr. Conde F. Conroy, Milwaukee, addressed the Brown-Kewaunee-Door County Medical Society, Green Bay, October 19 on management of varicose veins.——Drs. Alexander R. MacLean and John L. Emmett, Rochester, Minn., addressed the Eau Claire-Dunn-Pepin Counties Medical Society October 30 in Eau Claire on "Vascular Headache" and "Urinary Retention" respectively.——Speakers at a meeting of the Grant County Medical Society, Lancaster, October 25 were Drs. John C. Pickard, Dubuque, Iowa, on "The Ear, Nose and Throat in General Practice"; Horace Kent Tenney Jr., Madison, "Vomiting in the Newborn"; Walter C. Alvarez, Rochester, Minn., "Treatment of Indigestion," and Marcos Fernan-Nunez, Milwaukee, "Cancer—Its Prevention and Control."——Dr. William J. Bleckwenn, Madison, addressed the Green Lake-Waushara County Medical Society, Princeton, October 24 on "The Use of Barbiturates in General Practice."

WYOMING

State Medical Election.—Dr. Peter M. Schunk, Sheridan, was named president-elect of the Wyoming State Medical Society at the recent annual meeting of the house of delegates during the Rocky Mountain Medical Conference in Salt Lake City in September. Dr. Roscoe H. Reeve, Casper, was elected vice president and Dr. Marshall C. Keith, Casper, reelected secretary. Dr. John H. Goodnough, Rock Springs, became president. Next year's meeting will be in Sheridan.

GENERAL

Impostor Sells Surgical Supplies.—William R. Warner and Company, St. Louis, has reported an impostor said to be selling surgical supplies in Chicago under the name "Warner and Company." The man is said to be about 50 years of age and of dignified appearance. In some instances he has used the name of "Mr. Warner," according to the report. In making these alleged sales, for which he has been receiving deposits, this man uses a duplicate sales order book and a red rubber stamp "Warner and Company."

Physician in China Appeals for Medical Books.—The American Library Association has received an appeal from a physician on the staff of the Methodist Mission, Lingling, Hunan, asking for medical books. Dr. Vilma Lasser writes: "I am in great need of surgical books, especially those concerning obstetrics or treatment of tropical diseases in English, German or French. I lost all my books when the Hudson Taylor Memorial Hospital was destroyed in the great fire at Changsha in November last year." Dr. Lasser originally wrote to the American Library Association concerning books which that association is collecting for Chinese libraries, but the association states that probably little can be done through that channel.

Specialists Urge Care for Handicapped Children.—The American Academy of Ophthalmology and Otolaryngology at its annual meeting in Chicago in October adopted a resolution urging that funds be provided by foundations and other appropriate agencies to give attention to children with visual, hearing and speech defects. The resolution recommended that adequate programs be instituted to detect these deficiencies which constitute an actual or threatened handicap to school children and to provide, through the cooperation of qualified specialists in national, state and local medical societies, appropriate medical care for indigent and underprivileged children who may be afflicted or threatened with such handicaps. The American Laryngological Association passed a similar resolution at its recent meeting.

Special Society Elections.—Dr. Arthur J. Schwenkenberg, Dallas, Texas, was named president-elect of the Southern Psychiatric Association at the annual meeting in Louisville, Ky., in October. Dr. William E. Gardner, Louisville, was elected vice president and Dr. Newdigate M. Owensby, Atlanta, reelected secretary. Dr. Charles D. Mitchell, Whitfield, Miss., was installed as president and Jacksonville, Fla., was selected as the place for next year's meeting.——Dr. Paul A. Turner, Louisville, Ky., was elected president of the Southern Tuberculosis Conference at the annual meeting in Charleston, S. C., in October. The 1940 meeting will be in Monroe, La.——Dr. William B. Porter, Richmond, Va., was elected president of the American Clinical and Climatological Association at the annual meeting at Saranac Lake, N. Y., in October and Dr. Francis M. Rackemann, Boston, was reelected secretary.

Meeting of Tropical Medicine Groups.—The American Society of Tropical Medicine will hold its thirty-fifth annual meeting in conjunction with the American Academy of Tropical Medicine and the National Malaria Committee November 21-24 in Memphis, Tenn. William H. Taliaferro, Ph.D., Chicago, will deliver the fourth Charles Franklin Craig Lecture Tuesday November 21 on "The Mechanism of Acquired Immunity to Metazoal Parasites," and the Walter Reed Medal will be awarded to Dr. William B. Castle, Boston. Dr. Alfred C. Reed, San Francisco, will deliver his presidential address at the annual luncheon of the society November 23 on "The Future of Tropical Medicine." Among speakers on the program will be:

Dr. Edward B. Vedder, Washington, D. C., A Discussion of the Etiology of Sprue with a New Hypothesis.
Dr. Alvin E. Keller, Nashville, Tenn., Studies of Hookworm Disease in Six Southern States During the Period of 1930-1938.
Drs. Thomas B. Magath, Rochester, Minn., and Henry E. Meleney, Nashville, Tenn., The Complement Fixation Reaction for Amebiasis.
Dr. Lowell T. Coggeshall, New York, The Selective Action of Sulfanilamide in Malaria.
Dr. Harry Most, New York, Malignant Malaria in Drug Addicts; Epidemiologic, Clinical and Laboratory Studies.

The sixth annual dinner of the American Academy of Tropical Medicine will be held Thursday evening. William W. Cort, Ph.D., Baltimore, will deliver his presidential address on "Research on Helminth Diseases and Public Health Progress" and the second award of the Theobald Smith Medal of George Washington University will be made to Dr. Richard P. Strong, Boston.

Fellowships for Women Physicians.—The Women's Medical Association of New York offers two Mary Putnam Jacobi fellowships for 1940. One of $500, available January 1, will be given to an American woman physician to carry on or complete some special problem in medical research. Applications must be in by December 1. In addition, the regular fellowship of $1,000, available October 1, is open to any woman physician, American or foreign. Applications for this fellowship must be received by March 1, 1940. For both fellowships applicants must be graduates of reputable medical schools. Applications should be filed with the secretary of the committee and must be accompanied by statements as to health, educational qualifications, previous work and a proposed problem for investigation and by a photograph of the applicant. The secretary is Dr. Phebe L. Dubois, 150 East Seventy-Third Street, New York.

Southern Medical Association.—The thirty-third annual meeting of the Southern Medical Association will be held in Memphis, Tenn., November 21-24, at the Municipal Auditorium, under the presidency of Dr. Walter E. Vest, Huntington, W. Va. Tuesday November 21 will be "Memphis Day" with several clinical sessions making up the program. Dr. Rock Sleyster, Wauwatosa, Wis., President of the American Medical Association, will be among the speakers at a general session Wednesday, on "What Price Depression?" Among guest speakers at meetings of the nineteen sections will be:

Dr. Fritz B. Talbot, Boston, Present Status of the Endocrine Diseases of Childhood.
Dr. Florence Rena Sabin, Denver, Colo., Cellular Reactions to a Marked Antigen.
Dr. Henry Alsop Riley, New York, Some Observations on the Mechanism of Headache and Migraine.
Dr. Arnold D. Jackson, Madison, Wis., Surgical Treatment of Diseases of the Biliary Tract.
Dr. Ralph K. Ghormley, Rochester, Minn., Study of Acute Infectious Lesions of the Intervertebral Disks.
Dr. Charles E. Galloway, Evanston, Ill., An Evaluation of Glycogen-Free Epithelium of the Cervix and Vagina.
Dr. Alexander Randall, Philadelphia, Etiology of Primary Renal Calculus.
Dr. Harry S. Gradle, Chicago, Glaucoma Errors That I Have Made and That I Have Seen.
Dr. Ernest L. Stebbins, Albany, N. Y., Recent Studies of Epidemic Diarrhea and Dysentery.

There will be a public meeting Tuesday evening with the following program:

Dr. Seale Harris, Birmingham, Vitamin Facts and Fads.
Dr. Irvin Abell, Louisville, Ky., Some of the Contributions of Medicine to Public Welfare.
Rev. Alphonse M. Schwitalla, St. Louis, Society's Debts to the Doctor.

CORRECTION

Address of Dr. G. Marshall Crawford.—In the title of the paper by Crawford and Ray in THE JOURNAL, November 4, page 1715, the address of Dr. G. Marshall Crawford should have been Boston. The error came about by changing Dr. Leon F. Ray's address from Boston to Portland, Ore., and failing to insert Boston under Dr. Crawford's name.

Government Services

Physicians Wanted in the CCC

A recent decision of the director of the CCC and the War Department permits the employment of physicians who are not medical reserve officers in this service. The principal duties at camps consist of the medical care of the enrollees and the practice of preventive medicine. To be eligible, the physician must be legally qualified to practice medicine and physically able to perform the duties involved. No quarters are provided for families and the physician will be required to pay for his own food at camps. Temporary quarters will be provided for a nominal fee. Those selected will be required to pay their own traveling expenses to the nearest district headquarters, where they will be put on temporary duty for instruction before being sent to camps. Traveling expenses incurred in the transfer from the district headquarters to camps or from one camp to another will be paid by the government. Physicians interested in this type of service are requested to submit their applications to the office of the Surgeon, Headquarters of the Seventh Corps Area, Federal Building, Omaha, giving date when available and preference of assignment in the following states: Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, Kansas and Arkansas. Attention is directed to a change in the initial salary for physicians employed in the Civilian Conservation Corps. The salary was changed October 10 from $2,600 per year to $3,200.

Foreign Letters

PARIS

(From Our Regular Correspondent)

Oct. 11, 1939.

American Hospital of Paris

The American Hospital with its 500 beds, its fine equipment and its staff of physicians and selected nurses has just been placed by Dr. Gros, its superintendent, at the disposal of French war victims. Hospital services have been transferred to Etretat on the coast of Normandie, where 1,500 wounded or sick can be accommodated. On the other hand, a certain number of French hospitals have been closed, either because of the difficulty of evacuation in case of bombardment or because of the considerable reduction in the number of inhabitants of Paris in consequence of mass migrations.

Treatment of Craniocerebral War Wounds

The Académie de chirurgie held its opening fall session September 20. Gosset sent a cordial welcome with the best wishes of the members to all French and allied surgeons. He proposed a work plan and expressed the hope that the interallied medical conferences conducted during the World War at Val de Grâce at the initiative of Mr. Lloyd George would be revived because of their great usefulness. The principal papers of this meeting were devoted to craniocerebral wounds and their treatment and were read by Thierry de Martel, the distinguished surgeon of the American Hospital of Paris, and Clovis Vincent, professor of neurosurgery in the medical faculty of Paris. Vincent arrived at cerebral surgery by way of neurology and de Martel by way of general surgery. De Martel modestly acknowledges his indebtedness to Cushing and Mackenzie. The two papers differed on certain points but were in general agreement. For that reason they are reviewed together. A neurosurgical operation in itself constitutes a craniocerebral trauma. The physiopathologic sequels are the same and the technics of attack on the cerebral tissue are analogous. However, there is a considerable difference in the traumatic agents and likewise important differences between war wounds and ordinary traumas, such, for example, as are due to automobile accidents.

In an automobile accident, a head weighing 17.6 pounds (8 Kg.), considered as a projectile and launched at the rate of 72 kilometers an hour, on striking an object effects an impact equivalent to 160 kilogrammeters. The surface area involved is wide. In a war wound, however, caused for example by a bullet of 15 Gm. projected at 450 meters per second, the bullet attains an impact effect of 150 kilogrammeters. However, the surface involved is small. In the former case manifold lesions may be observed as well as significant concussion effects; in the latter, the lesions are concentrated and deeper; often the damage done on the surface is negligible compared with that to the nervous tissue. Today, with the progress that has been made in surgery of the cerebral tissues, one ought to bring about healing in many more cranial wounds and, above all, prevent better than was formerly possible the horrible effects which overshadowed the prognosis of those surgically cured. For that reason, speed is of utmost importance. The wounded should be brought to the surgeon before the appearance of edemas destructive to the brain, especially near the gray columns and the bulb. Early intervention prevents in the great majority of cases the principal risks of traumas and interventions, namely, hematomas, cerebral hernias or fistulas of the cerebrospinal fluid, excessive loss of bony substance and disastrous cicatrizations which affect the skin, bone and cerebral tissue and induce epilepsies and mental disorders. These benefits cannot be realized unless the surgeon is competent and well supplied with the necessary equipment: head equipment, mechanical trephines, Cushing-Mackenzie clips, electrocoagulation apparatus of high frequency, low voltage and of weak intensity, wax to close osseous orifices, refractors, aspirators, irrigators for warm solutions, and black silk which resists decomposition. Anesthesia will be local preferably. Epileptic crises will be forestalled or managed with barbiturates, chlorol and bromides intravenously administered. Systematic roentgenography will reveal the presence of a projectile and bony splinters. A shutter will be made in the cranium according to the de Martel method, which enlarges the operative field. Its hinge will be made of muscular or aponeurotic tissue. The dura mater ought to be attached to the cranial periosteum or the deep wound portions by a fine catgut suture and its hemostasis assured by means of clips or electrocoagulation. Lesions of the cerebral tissue will then be clearly in view. Contused portions will be removed by means of scissors.

The delicate matter of hemostasis with its inundation in the absence of definite blood vessels will be managed by the aspirator. It will show the bleeding points and indicate where clips should be used or coagulation performed with low current. At times, especially if a deeply embedded bullet is to be removed, it will be necessary to make a complementary cranial shutter. On completion of hemostasis suture is made. Whenever possible, one ought to suture along the galea, because it resists cerebral pressure better than the elastic skin of the scalp. The most difficult part of this surgery seems to be hemostasis of the sinuses. It is here that experience and surgical skill will be important. According to Vincent, brain surgery is a part of general surgery and can be easily learned. There are in France quite a few capable brain surgeons, but the number of wounded may require additional specialists. Lenormant would like to see centers created for the treatment of cranial wounds and for the instruction of physicians at the front on indications for immediate action in lesions of the skull and cerebral tissue.

French Scientific Societies

Some other societies have canceled their fall meeting and among them are the Society of Dermatology and Syphilography, which was to meet in Paris October 12-14, and the cancer society scheduled for October 8.

BERLIN

(From Our Regular Correspondent)

Sept. 20, 1939.

Mothers of Large Families in Germany

In the census of 1933, restricted to Germany before its territorial conquests, were registered 3,577,000 married women, exclusive of widows and divorcées, with four or more children, which is 24.7 per cent of all married women. Of these, 1,148,000 had four children and the remaining five or more. Of the latter, 735,000 had five children, 869,000 had six or seven children and 825,000 had eight or more. In the period between the middle of 1933 and the beginning of 1939 the number of married women with four children and more decreased by 160,000 (those with four or five by 80,000; those with six or seven by 30,000 and those with eight or more by 50,000). On the other hand, the total number of married women during the same period of time increased by about 1,563,000 to a total of 16,061,000. Widows and divorced women, not included in the figures given here, with four or more children were reported at the beginning of 1933 to total 1,600,000; with four or five children 750,000, with six or seven children 400,000 and with eight or more children 450,000.

Therapy by Fasting

The Frankfurter medizinische Gesellschaft recently considered the question of fasting. H. E. Meyer first discussed the basic principles underlying the therapeutics of fasting. During

the first days of fasting, he said, a brief diminution of nitrogen excretion is followed by an increased excretory activity. Urea elimination keeps pace with the level of the total nitrogen excretion until the end of the first week of fasting. This is followed by a decrease, as part of the nitrogen is contained in the increased elimination of ammonia induced by acidosis. Very little uric acid is excreted from the time fasting is begun. Modifications of nitrogen elimination during the first week are related to the carbohydrate level. No observations were made that would indicate an increased retention of urea and uric acid before fasting therapy was initiated. There is, however, a great probability that intermediary metabolic products are excreted in increased quantities, especially during the first week. What the nature of these products is is not clear. A part of them belongs to the group which can be detected in the xanthoprotein test. Patients with high arterial blood pressure and chronic constipation show an especially high excretion of xanthoproteins. Control of oxygen eliminated shows that after an incipient deterioration of oxidation, oxidation improves more favorably than before fasting. In capillary microscopy one can clearly observe a diminution of the abnormally heightened capillary tonus. It invites the reflection that the increased elimination of intermediary metabolic products, which in turn participate in the decompensatory peripheral processes, represents a contributing cause in its favorable effect on circulatory diseases, especially in cases of high arterial blood pressure.

Changes in the metabolism of carbohydrates and fats are characterized by the sudden and marked development of acetone during the fifth and tenth day of fasting. However, an increased ketosis does not occur. Since the body manifestly adjusts itself readily to a diminution of glycogen, the elimination of acetone decreases again within a few days to an almost normal level. Feeding with grape sugar frequently demonstrates, beginning with the third week, a marked secondary hypoglycemia. The acidity crisis contributes essentially to cause a change of the organism, which change, in turn, mobilizes the defensive forces of the organism. This can be clearly seen in the heightened bactericidal power of the blood.

BELGIUM

(From Our Regular Correspondent)

Oct. 18, 1939.

Pensions for Aged Physicians

A most important corporate reform is under way, namely, the establishment of a pension system for aged physicians. The medical profession of Brussels cordially favors the idea that the directors of the Federation of Belgian Physicians follow the example set by the French, who have demonstrated what the members of a profession still entitled to be called liberal can accomplish without the support of the state. The plan is approved by the French medical syndicates, which represent four fifths of the physicians practicing in France and in the colonies. Actuarial computations are in progress. Within two years, no doubt, several thousands of aged physicians can retire and be entitled to at least a partial pension. It would be unfair to allot to them the full or normal pension in view of the fact that no assessment has been levied on them. However, they will receive about 8,000 francs if they make no contribution and 10,000 if they can contribute a small amount, equivalent to 5 per cent of 1,000 francs. The younger members of the profession will receive, at the time of retirement, from 25,000 to 29,000 francs. The highest premium will probably be 3,000 francs. Certain other risks are also taken into account, such as half pensions for widows, reimbursement for funeral expenses and special grants for physical disability.

Socialized Medicine

Before the Société médico-chirurgicale of Brabant, M. Schwers initiated a discussion on present tendencies in medical organization, championing the private character of the physician's status and practice. He asserted that private practice should remain the basis of all plans of organized medicine and that mass medicine was not feasible either from the financial or from the social point of view. The results would be disastrous. His statement evoked much criticism; although the assembly agreed that it was undesirable to see medicine converted into a state function, yet it was true that relations between medicine and the state should exist and develop. On the problem of the relation of medicine to the state, Massion presented the following point of view: The state cannot practice medicine in the current sense of the word. Freedom of choosing one's physician and the confidential character of his services must be rigorously respected in medical practice as the foundation of the healing art. The role of the state, however, is great. It must stimulate, direct and supplement, laboring to place medical service within the reach of all. The physician, while refusing to allow the fundamental character of his medical acts to be altered, ought to work in cooperation with the state for a better public health and a better medical service. An exclusively negative attitude like that of Schwers was not tenable, he said. Medicine cannot ignore the state, nor can the state divest itself of an interest in the organization and solution of the pressing problems of public health.

The New Tumor Center in Brussels

The Institute Jules Bordet, replacing the Centre des tumeurs de l'hôpital Brugmann, which had outgrown its usefulness, was recently dedicated. The building is constructed on the two wing plan. One wing, with eight stories, is intended for hospitalization; the other, six stories high, is given over to rooms and quarters for the examination of patients, for roentgenography and diagnosis, for apparatus for radium therapy, for surgical rooms and for laboratories and libraries. The eight story wing contains an auditorium and museum, administrative offices and consultation rooms for heads of departments, wards and rooms for hospital service, and the kitchen and dining rooms for the medical staff, nurses and relatives of the patients. The public aid committee has assumed the task of the construction of the building. The university has furnished the money for the acquisition of a part of the land and the x-ray, the scientific and the diagnostic equipment necessary for the treatment of cancerous patients as well as for the study and instruction of cancerology. Thanks to the National Funds for Combating Cancer, the institute has 6.5 Gm. of radium.

Scientific control will be vested in the university and hospital service in the Committee on Public Aid. The new center has been named the Jules Bordet Institute as a tribute to an eminent scientist of whom Belgium is proud.

Tuberculosis Among Workers in Tobacco Factories

Dr. Peremans reported (*Arch. de méd. soc. et d'hyg.* 1938, number 8) the results of his investigations in the Van der Elst tobacco factory at Louvain. Only workers directly in contact with tobacco were considered; these numbered 876, of whom 317 were men and 559 women. The average age was respectively 37 and 26, and the average work duration respectively eighteen and nine years. The workers examined were classified as: (1) those who had no notable pulmonary lesion, (2) those who had inactive pulmonary lesions and (3) those who had active pulmonary lesions. Cardiac and bone anomalies were also noted. Of the 317 men, twenty-four were found with active and sixty-seven with inactive pulmonary tuberculosis, twenty-four with cardiac lesions and five with bone anomalies. The figures for the women were respectively eleven, seventy, fifteen and four. Of the thirty-five suspected male and female

workers of the third group, thirty-four were given clinical tests with the following results: Active open tuberculosis appeared in two men and two women, active closed tuberculosis in eight men and four women, inactive tuberculosis in twelve men and five women and nontuberculous lesions in two men. The summarized report on the 876 workers indicated the following distribution: (1) sixteen cases (1.82 per cent) of pulmonary tuberculosis in evolution in four of which (0.45 per cent) there were open lesions, and (2) 154 cases (17 per cent) of inactive pulmonary tuberculosis. A comparison of these figures with those for other industries warrants the assumption that morbidity due to tuberculosis is practically no higher among workers in tobacco factories, on the average, than among workers in other industries.

FINLAND

(From a Special Correspondent)

Oct. 24, 1939.

Goiter as a National Problem

While goiter has been given much prominence in certain countries such as Switzerland, little is known in the outer world of the goiter problems with which Finland has to cope. Even in Finland itself there has hitherto been an inadequate appreciation of the nature and extent of these problems, and it is largely owing to the studies of Dr. Johannes Wahlberg, conducted during the past fifteen years, that a more or less comprehensive survey of the situation has now been made.

The area in which goiter is endemic corresponds almost exactly to that part which was dry mainland at the end of the ice period, when much of what is now high and dry was under the sea. In some parts, 10 per cent of the young men of military age have been found to present enlargement of the thyroid gland, and as the ratio of males to females suffering from goiter is about 1 to 5, it will be realized how prevalent this ailment is in the worst goiter districts. In the Pathological Institute in Helsingfors about 300 cases have been investigated in the course of a few years; in his clinical work, Dr. Wahlberg has dealt with 2,350 cases. The most characteristic feature of the endemic in Finland is the remarkably high frequency with which the enlargement of the thyroid is adenomatous; in the larger thyroids, adenomatous enlargements are demonstrable on palpation in about 90 per cent, and when the gland is subjected to a histologic examination it is most rare not to find any adenomatous changes.

There are still some doubts as to the wisdom of Finland following the example of Switzerland in the matter of iodine prophylaxis. May it not, it is asked, be wiser to wait and see how the Swiss, who have been given prophylactic doses of iodine throughout childhood, behave in adult life? Meanwhile, operative treatment in the most serious cases seems still to be the most effective, most economical and most speedy remedy.

The Growing Frequency of Abortions

The changed outlook from the moral and social points of view of the community in the matter of induced abortions has lately been demonstrated in a statistical study by Dr. Aulis Apajalahti of Helsingfors. His study deals with 21,007 cases of abortion admitted to the public hospitals in Helsingfors in the period 1901-1937. When the number of abortions was compared with the number of women of child-bearing age in Helsingfors it was found that the ratio of the one to the other had increased more than six times—from 1.9 to 12.5 per thousand. While the frequency of abortions has gone up by leaps and bounds, the birth rate has declined even more dramatically. For example, in the period 1907-1909, the birth rate, expressed in terms of the number of births per thousand women of child-bearing age, was 80.2 In the period 1934-1936 the corresponding figure was only 27.

Dr. Apajalahti notes that in 1936 the population of Finland was 3,807,163, and he quotes the somewhat gloomy prognostication of an unnamed statistician who has calculated that the population will never exceed 4 millions. Be this as it may, the attitude of women today toward the induction of abortion must be different from what it was only a generation ago. In the period under review, the ratio of febrile abortions in the public hospitals in Helsingfors to the total number of pregnancies has increased sixty-six times, i. e. from 0.2 to 13.5 per cent of all pregnancies. On the other hand, the ratio of afebrile abortions has in the same period increased only sevenfold, i. e. from 2.2 to 14.3 per cent. The calculation is also made that though all ages are involved in this rising tide of abortions, for the most part presumably induced, it is in the group below the age of 30 that this rise is most marked. As is to be expected, it is the unmarried woman whose pregnancies are most liable to end in induced abortions. Indeed, at the present time, the chances are that 67 per cent of the pregnancies of unmarried women will end in abortions.

Vaccination Problems

Until a few years ago Finland seemed to be immune to those sequels to vaccination which have caused great uneasiness in other European countries such as Holland and England. In 1932 the first cases of encephalitis following vaccination were reported. These cases—there were only four—were, however, enough to cause grave concern for the public health authorities already embarrassed by widespread neglect of vaccination in the country. After a careful consideration of every aspect of the subject, the public health authorities succeeded in framing a new vaccination law which came into force on Jan. 1, 1937. This law reflected recent experiences with regard to diseases of the central nervous system following vaccination, and provision was made for the wholesale vaccination of children before they reached that age at which encephalitis is most likely to follow vaccination. The law provides that children are to be vaccinated before the end of the calendar year in which they attain the age of 2 years. Neglect of this order is to be punishable. The effect of this law was a marked rise in 1937 in the number of vaccinations, which reached 162,877, or 56 per cent of all the children due to be vaccinated in that year. The corresponding percentage for 1935 was only 22.8, and for 1936 it was 33.9.

It was unfortunate that five new cases of acute disease of the central nervous system following vaccination should occur in 1937, the first year of the operation of the new vaccination law. Dr. Lars Grönlund, who has issued a special report on these five cases, has advanced a new theory as to the underlying causes of postvaccinal encephalitis. His theory hinges on the observation that in one of his cases, that of a girl aged 5 years, typical myasthenia gravis had developed at the age of 2. Dr. Grönlund suggests that the myasthenia gravis may have been a hormone-deficiency or a vitamin-deficiency disease, which lowers the resistance of the central nervous system to the usually harmless virus of vaccinia.

THE NETHERLANDS

(From Our Regular Correspondent)

Oct. 18, 1939.

Gout

Dr. Van Breemen presented a study before the Journées Médicales de Bruxelles on the pathology of gout in the Netherlands. From the statistical point of view the disease is rare in this country. However, the disease exhibits a powerful interest: If gout did not exist, the history of the world would have a different aspect. Gout is no longer recognized by the practitioner with the facility which formerly characterized its diagnosis. Now as formerly the pathogenesis of gout, in spite of hundreds of investigations, is unknown. Its anamnesis, habitus, articular deviations, uric acid content in the blood, tophus and roentgen aspect have their value for diagnostic pur-

poses, but in different degrees. The speaker made observations on different diagnostic facts. Various forms like rheumatoid gout, chronic gout in women and the irregular type (atypical Goldscheider type) were observed; they are more frequent in the Netherlands than the classic type.

Religious Affiliation of University Students

University statistics furnish the following data on the religious preferences of students enrolled in the different faculties and departments:

	Protestants	Roman Catholics	Jews	Orientals	Other Religions	No Religious Connections	Unknown
Theology	93	6.4	...	...	...	0.5	0.1
Law	48.1	20.7	3.9	...	0.4	26.5	0.4
Law and letters	45.1	12.6	1	5.2	1.3	34.8	...
Medicine	48	17.3	3.3	0.2	0.3	30.8	0.1
Mathematics and natural sciences	46.4	13.8	3.1	0.1	0.5	36	0.1
Mathematics and letters	44.1	17.8	3.1	0.3	0.3	34.4	...
Philosophy and letters	42.2	26.6	3.9	0.2	0.4	26.3	0.4
Veterinary studies	59.8	17	1.3	0.6	0.3	21	...
Social sciences							
Amsterdam	35.7	10.2	9.5	...	0.5	44	0.1
Rotterdam	53.2	10.2	2.9	0.5	2.3	30.9	...
Tilburg	2.1	97.1	0.3	...	...	0.5	...
Delft	39.4	10.8	0.9	0.2	0.5	47.2	1
Wageningen	54.4	13.3	0.9	1.2	1.1	29.1	...
Total	48.3	17.1	2.9	0.4	1	30	0.3
The Netherlands	46.8	36.3	1.3	...	...	15.6	...

AUSTRALIA

(From Our Regular Correspondent)

Oct. 11, 1939.

The Biochemical Changes in Stored Blood

An attempt to obtain a more precise knowledge of the biochemical changes that take place in stored human blood has recently been made by Marjorie Bick, working at the Walter & Eliza Hall Institute, Melbourne. Seeking conditions under which blood might be stored for longer periods than has hitherto been possible, she has determined during storage the content of dextrose, urea, creatinine, nonprotein nitrogen, reduced glutathione and uric acid in whole blood and the ionic phosphate content of the plasma.

It was found possible to keep the blood from fourteen to seventeen days at 0 C. before any sign of hemolysis was observed. The onset of hemolysis appeared to be associated with two significant changes in biochemical composition, namely an increase in both the nonprotein nitrogen of the blood and the ionic phosphate content of the plasma. The dextrose content of the whole blood invariably decreased almost to zero before hemolysis began, but the artificial maintenance of a high concentration of dextrose only delayed hemolysis for a short period.

The behavior of blood stored under anaerobic conditions was also investigated. The results show that anaerobic conditions hasten the decrease of dextrose but are without effect on the development of the other changes observed.

Cells washed free from plasma with buffered saline solution, with or without the addition of dextrose, hemolyzed much more readily than did erythrocytes suspended in their own plasma, and the increase in nonprotein nitrogen was concurrently larger and more rapid. When, however, cells were washed and stored in buffered saline solution containing 8 per cent sucrose, their stability was markedly increased and the changes in the concentrations of nitrogenous constituents were slower. As the sucrose was dissolved in saline solution the erythrocytes were not agglutinated to any extent, so that any effect due to mechanical aggregation of the erythrocytes appeared to be excluded.

The very slight increase in the concentration of phosphate ions in stored plasma, compared with the high increase observed in whole blood, indicates that the ionic phosphate content has some connection with the hemolytic process.

The biochemical changes that take place do so almost entirely in the erythrocytes, but the essential nature of the process remains unknown.

Passive Immunity in Experimental Whooping Cough

Most investigators of prophylactic vaccination against whooping cough have stressed the need for some laboratory test to detect the appearance and duration of immunity. E. A. North and his colleagues working at the Commonwealth Serum Laboratories and the Children's Hospital in Melbourne have recently described methods for the demonstration of an antibody protecting mice against infection with Haemophilus pertussis when injected intranasally under anesthesia. This protective action, they state, is the result of the development of a specific antibacterial antibody in the serum following natural infection with Haemophilus pertussis or artificial immunization. The protective antibody was not present in the serums of nonimmunized children who had not had whooping cough but appeared following prophylactic immunization. It was present in the serum of most adult contacts of patients with whooping cough following symptoms suggestive of mild infection but was not present in healthy young adults who had had no contact with these patients.

These workers conclude, therefore, that this antibody, demonstrable directly by the injection of mice, plays an important part in the resistance of children immune to whooping cough as the result of the natural disease or prophylactic vaccination.

Marriages

WILLIAM MORGAN FOX, Columbia, S. C., to Miss Peggy Sugg Williams of Raleigh, N. C., in Durham, N. C., September 23.

LEWIS EARL FRASER, Hiwassee Dam, N. C., to Miss Alice Jean Keith of Memphis, Tenn., at Carthage, Miss., September 2.

NICHOLAS AARON WHEELER JR., Lafayette, Ala., to Miss Caroline Carmichael in McDonough, Ga., October 5.

MALCOLM DOUGLAS HARRISON, Washington, D. C., to Miss Sadye Belle Dailey of Blanche, N. C., October 7.

PETER DARLING CRYNOCK, Morgantown, W. Va., to Miss Louella Wilson of Fairmont, November 4.

KERMIT WENDELL COVELL, Angola, Ind., to Miss Evelyn Dickson at Asheville, N. C., November 2.

MAVIS P. KELSEY, Rochester, Minn., to Miss Mary Randolph Wilson of Beaumont, Texas, September 17.

ALEX CHALMERS HOPE, Union, S. C., to Miss Virginia Nalle Campbell of Charlotte, N. C., October 5.

ROBERT MAZET JR., New York, to Miss Catherine Metz of Springfield, Ill., September 23.

LEON J. ANSON, New York, to Miss Betty H. Bowers of Johnstown, Pa., October 11.

JAMES EVERETT MOORE, Ashland, Ky., to Miss Fern Harris of Winchester, October 8.

WALTER NICKEL, Rochester, Minn., to Miss Mona O'Neil of Minneapolis, recently.

WILLIAM FITZGERALD, Chicago, to Miss Hilda Duffy of Sycamore, Ill., September 12.

JOSEPH MARCOVITCH, Dwight, Ill., to Miss Lillian Ganzer in Brooklyn, September 6.

FRANK C. HAMMOND to Mrs. Theresa A. McTurk, both of Philadelphia, recently.

PAUL DERANIAN, Indianapolis, to Miss Mary Frances Setser at Brooklyn, recently.

WILLIAM E. ABBOTT to Miss Molly Temple, both of Cleveland, September 23.

JACK HULL, Indianapolis, to Miss Princess Cogan of Peru, Ind., in September.

Deaths

Livingston Farrand ✠ Brewster, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1891; president from 1921 to 1937 and since 1937 president emeritus of Cornell University; instructor of psychology at his alma mater from 1893 to 1901, adjunct professor of psychology from 1901 to 1903 and professor of anthropology, 1903-1904; president of the University of Colorado, Boulder, from 1914 to 1919; treasurer of the American Public Health Association from 1912 to 1914; from 1905 to 1914 was executive secretary of the National Association for the Study and Prevention of Tuberculosis, now known as the National Tuberculosis Association, of which he was elected president in 1923; member of the Colorado State Medical Society; in 1939 chairman of the advisory committee of the American Red Cross and chairman of the central committee from 1919 to 1921; director of tuberculosis work in France of the International Health Board, Rockefeller Foundation, 1917-1918; Officer of the Legion of Honor of France; member of the board of trustees of the American Museum of Natural History; formerly chairman of the board of trustees of the Carnegie Foundation for the Advancement of Teaching, of the National Health Council, New York State Public Health Council, the special New York State Health Commission appointed in 1930 and the advisory council of the Milbank Memorial Fund; received degrees from numerous universities; author of "Basis of American History" published in 1904; editor of the *American Journal of Public Health*, 1912-1914; aged 72; member of the board of governors of the New York Hospital, where he died, November 8, of bronchopneumonia and empyema.

Robert Sonnenschein ✠ Chicago; Rush Medical College, Chicago, 1901; associate clinical professor of laryngology and otology at his alma mater since 1933; formerly professor of diseases of the ear, nose and throat at the Post Graduate Medical School; member of the American Academy of Ophthalmology and Otolaryngology, the American Laryngological Association, the American Laryngological, Rhinological and Otological Society and the American Otological Society; fellow of the American College of Surgeons; past president of the Chicago Laryngological and Otological Society; member of the medical advisory board of the third district in Illinois during the World War; contributed a chapter on testing of hearing in Jackson and Coates's book "The Nose, Throat and Ear and Their Diseases," published in 1929, and a section on surgery of the ear in "A Text Book of Surgery" by Christopher, published in 1935; aged 60; since 1926 attending otolaryngologist to the Michael Reese Hospital, where he died, November 8, of paratyphoid infection and pneumonia.

Oscar H. Plant, Iowa City, Iowa; University of Texas School of Medicine, Galveston, 1902; professor of pharmacology at the State University of Iowa College of Medicine; instructor of physiology at the University of Texas, Galveston, 1901-1907, and assistant professor of physiology, 1907-1910; instructor of pharmacology, University of Pennsylvania, Philadelphia, 1911-1913, assistant professor of pharmacology, 1914-1918, and professor of pharmacology, 1918-1920; treasurer, 1929-1934, vice president 1935-1936, and president in 1939 of the American Society for Pharmacology and Experimental Therapeutics; in 1939 chairman of the executive committee of the Federation of American Societies for Experimental Biology; aged 64; died, October 2, of coronary sclerosis.

Charles Staples Mangum, Chapel Hill, N. C.; Jefferson Medical College of Philadelphia, 1894; member of the Medical Society of the State of North Carolina; since 1905 professor of anatomy, from 1933 to 1937 dean, from 1900 to 1905 professor of pharmacology and demonstrator of anatomy, and formerly professor of physiology and materia medica at the University of North Carolina School of Medicine; member of the American Association of Anatomists; aged 69; died, September 29, in a hospital at Durham of cirrhosis of the liver.

Louis Laval Williams ✠ Medical Director, U. S. Public Health Service, retired, Asheville, N. C.; Medical College of South Carolina, Charleston, 1880; was appointed assistant surgeon in the U. S. Public Health Service in 1885; for many years in charge of public health conditions at various immigrant stations; in 1920 was nominated by President Wilson assistant surgeon general at large; was retired in 1924; was made medical director in 1930 by an act of Congress; aged 79; died, September 17, of cerebral thrombosis.

Earl Lenwood Parmenter ✠ Lieut. Colonel, U. S. Army, retired, Mobile, Ala.; University Medical College of Kansas City, Mo., 1907; veteran of the Spanish-American and World wars; was commissioned a major in the medical corps of the U. S. Army in 1920, and was retired for disability in line of duty Oct. 31, 1937, with rank of lieutenant; aged 59; died, August 27, in the Jackson Infirmary, Jackson, Miss., of cardiorenal disease.

John Wilson Tappan ✠ Surgeon, U. S. Public Health Service, El Paso, Texas; University of Virginia Department of Medicine, Charlottesville, 1898; entered the U. S. Public Health Service March 20, 1917, and retired Nov. 1, 1933; formerly city and county health officer; fellow of the American College of Physicians; aged 71; died, September 2, in the William Beaumont General Hospital.

Curtis Dudley Pillsbury ✠ Lieutenant Colonel, M. C., U. S. Army, Fort Crook, Neb.; University of Michigan Homeopathic Medical School, Ann Arbor, 1914; served during the World War; was commissioned a first lieutenant in the medical corps in 1917, in 1919 a major and in 1937 a lieutenant colonel; aged 50; was killed, September 29, when his car was struck by a truck.

George Arthur Neal ✠ South West Harbor, Maine; Baltimore Medical College, 1905; president and formerly secretary of the Hancock County Medical Society; for many years a member of the school board and at one time superintendent of schools; on the staff of the Mount Desert Island Hospital, Bar Harbor; aged 67; died, September 17, of angina pectoris.

John E. Douglas, Garrett, Ind.; Chicago College of Medicine and Surgery, 1913; member of the Indiana State Medical Association; assistant professor of clinical pathology at the Baylor University College of Medicine, Dallas, Texas, and pathologist of the hospital, 1929-1930; aged 52; died, September 23, of coronary thrombosis and chronic myocarditis.

Walter S. Stevens ✠ Oklahoma City; National University of Arts and Sciences Medical Department, St. Louis, 1912; at one time superintendent of the Choctaw-Chickasaw Sanatorium, Talihina; medical director of district number 5, Indian Service; aged 54; died, September 11, in St. Anthony Hospital of lymphatic leukemia.

Walter C. McFadden ✠ Shelbyville, Ind.; Medical College of Indiana, Indianapolis, 1902; past president of the Shelby County Tuberculosis Association; formerly secretary of the city board of health; on the staff and at one time superintendent of the W. S. Major Hospital; aged 60; died, September 30, of coronary occlusion.

James Dodd Dixon, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1902; member of the board of health of Lachine; fellow of the American College of Surgeons; surgeon to the Lachine General and St. Joseph Hospital; aged 60; died, September 27, in the Royal Victoria Hospital.

Charles Lloyd Egbert, Hastings, Neb.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Nebraska State Medical Association; medical director and superintendent of a hospital bearing his name; aged 60; died, August 26, of heart disease.

Rudolph Duenweg, Terre Haute, Ind.; University of Louisville (Ky.) Medical Department, 1913; member of the Indiana State Medical Association; fellow of the American College of Surgeons; on the staff of St. Anthony's Hospital; aged 48; died, September 24, at Culver, of coronary embolism.

Herbert Scott Pattee, Manchester, N. H.; University of Vermont College of Medicine, Burlington, 1913; member of the New Hampshire Medical Society; served during the World War; on the staffs of the Elliot and the Balch hospitals; aged 52; died, August 26, in Tilton, of coronary thrombosis.

Cecil Boner O'Brien, Greencastle, Ind.; Indiana University School of Medicine, Indianapolis, 1923; member of the Indiana State Medical Association; physician to the student health service, DePauw University; aged 42; died, September 7, in the Robert W. Long Hospital, Indianapolis.

Joseph Savage Alford ✠ Los Angeles; University of Pennsylvania School of Medicine, Philadelphia, 1908; member of the Colorado State Medical Society; aged 55; died, September 23, in the Veterans Administration Facility, Sawtelle, Calif., of coronary thrombosis.

Allen Romayne Long, Buffalo; University of Buffalo School of Medicine, 1921; member of the Medical Society of the State of New York; instructor of medicine at his alma mater; on the staff of the Deaconess Hospital; aged 42; died, August 25, of myocarditis.

John Humes Barnfield ✠ Logansport, Ind.; Jefferson Medical College of Philadelphia, 1886; for many years member

of the school board; on the staff of St. Joseph Hospital; aged 75; died, September 27, in the Methodist Hospital, Indianapolis, of heart disease.

Capers Capehart Jones, Birmingham, Ala.; Philadelphia University of Medicine and Surgery, 1870; member of the Medical Association of the State of Alabama; Confederate veteran; aged 93; died, September 7, of angina pectoris and arteriosclerosis.

William E. Craig, Joplin, Mo.; University of Kansas City Medical Department, 1884; member of the Missouri State Medical Association; aged 76; on the staffs of the Freeman Hospital and St. John's Hospital, where he died, October 9, of heart disease.

Thomas Alva Strain, Meridian, Miss.; Chicago College of Medicine and Surgery, 1914; member of the Mississippi State Medical Association; served during the World War; aged 52; died, September 21, of hypertension and arteriosclerotic heart disease.

Henry Dundor Kunkel ✠ Reading, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1929; on the staff of the Reading Hospital; aged 36; died, September 2, in Berlin, Germany, of complications following an operation for appendicitis.

Patrick H. Veach ✠ Staunton, Ind.; Medical College of Indiana, Indianapolis, 1891; an Affiliate Fellow of the American Medical Association; formerly county coroner and member of the state legislature; aged 77; died, September 4, of cerebral hemorrhage.

James Benham Lucas, West Alexandria, Ohio; University College of Medicine, Richmond, Va., 1899; member of the Ohio State Medical Association; for many years member and president of the local board of education; aged 63; died, September 22.

Parish Stewart Smith, Conyers, Ga.; Atlanta College of Physicians and Surgeons, 1904; member of the Medical Association of Georgia; aged 62; died, September 7, in the Emory University Hospital of femoral hernia, acute appendicitis and peritonitis.

Roy Winton Johnson, Indianapolis; Northwestern University Medical School, Chicago, 1912; served during the World War; surgical adviser to the Aetna Casualty and Surety Company; aged 57; died suddenly, September 4, of coronary occlusion.

Henry D. Grady ✠ Miami, Mo.; University of Missouri School of Medicine, Columbia, 1880; Bellevue Hospital Medical College, New York, 1881; an Affiliate Fellow of the American Medical Association; aged 83; died, September 2, of pyonephrosis.

Charles Russell Weaver ✠ Twin Falls, Idaho; Harvard Medical School, Boston, 1925; served during the World War; formerly secretary of the Southside Medical Society; aged 42; died, September 7, in the Portland (Ore.) Medical Hospital of uremia.

James Horace Stimson Jr., Galveston, Texas; University of Tennessee College of Medicine, Memphis, 1938; on the staff of the U. S. Marine Hospital; aged 26; died, September 13, of inhalation pneumonia and burns received in an explosion on a launch.

Robert Milton Wolfe, South Norwalk, Conn.; Maryland Medical College, Baltimore, 1901; member of the Connecticut State Medical Society; at one time mayor; on the staff of the Norwalk Hospital; aged 62; died, September 26, in New York.

Walter Jones Adams ✠ Norfolk, Va.; Medical College of Virginia, Richmond, 1895; an Affiliate Fellow of the American Medical Association; at one time acting assistant surgeon in the U. S. Public Health Service; aged 74; died, September 16.

Alfred Christopher Scaccia, Bound Brook, N. J.; University of Louisville (Ky.) School of Medicine, 1936; member of the Medical Society of New Jersey; aged 29; died, September 18, in the Neurological Institute, New York.

Harry Preston Pratt, Chicago; National Homeopathic Medical College, Chicago, 1892; Harvey Medical College, Chicago, 1896; Bennett College of Eclectic Medicine, Chicago, 1896; aged 79; died, September 14, of chronic myocarditis.

Joseph H. Bradfield, Atlanta, Ga.; Atlanta Medical College, 1893; member of the Medical Association of Georgia; formerly superintendent of the Battle Hill Sanatorium; aged 72; died, September 6, of arteriosclerosis and chronic myocarditis.

Leon Izgur, Brooklyn; Atlanta College of Physicians and Surgeons, 1913; member of the Medical Society of the State of New York; formerly superintendent of the Greenpoint Hospital; aged 55; died, September 27, of coronary thrombosis.

Frederick William McKenney, Brookline, Mass.; Tufts College Medical School, Boston, 1919; aged 45; on the staff of St. Elizabeth's Hospital, Boston, where he died, September 11, of peritonitis following an operation for appendicitis.

William Feland Hickle ✠ Kenedy, Texas; Hospital College of Medicine, Louisville, Ky., 1904; formerly city and county health officer; member of the state parole board; aged 66; died, September 23, in the Beeville (Texas) Hospital.

Manfred C. McNew, Ada, Okla.; Dallas (Texas) Medical College, 1902; member of the Oklahoma State Medical Association; aged 69; died, September 1, in Breco's Memorial Hospital of an overdose of morphine, self administered.

Allen Malone Kilgore ✠ Los Angeles; Rush Medical College, Chicago, 1919; served during the World War; aged 47; died, September 25, in the Good Samaritan Hospital of injuries received in an automobile accident.

Oscar Rodney Emerson ✠ Newport, Maine; Medical School of Maine, Portland, 1894; member of the board of registration of medicine; aged 67; died, September 27, of injuries received in an automobile accident.

Jefferson Davis Yates, Orange, Texas; Southern Medical College, Atlanta, Ga., 1895; county health officer; past president of the Orange County Medical Society; aged 78; died, September 25, in a local hospital of typhus fever.

Peter Charles Dodenhoff ✠ Detroit; Michigan College of Medicine and Surgery, Detroit, 1901; for many years on the staff of St. Mary's Hospital; aged 60; died, September 23, of chronic myocarditis and arteriosclerosis.

Murray Emerson Reeder, Columbus, Ohio; Starling-Ohio Medical College, Columbus, 1910; member of the Ohio State Medical Association; served during the World War; aged 52; died, September 16, of thrombosis.

George Britton Grim, Evansville, Ind.; Kentucky School of Medicine, Louisville, 1895; member of the Indiana State Medical Association; aged 72; died, September 5, in the Methodist Hospital, Indianapolis.

Merville H. Carter, Baltimore; College of Physicians and Surgeons, Baltimore, 1878; formerly member of the board of education; aged 81; died, September 5, of cerebral hemorrhage, arteriosclerosis and hypertension.

Stoddard Sprague Martin, Windsor, Vt.; Hahnemann Medical College and Hospital of Philadelphia, 1888; served during the World War; health officer; aged 72; died, September 25, of arteriosclerotic heart disease.

Leonard J. Lunsford, Montalba, Texas; Dallas (Texas) Medical College, 1904; aged 63; died, September 10, in the Missouri Pacific Lines Hospital, Palestine, of pneumonia following injuries received in a fall.

William Powell Buck Jr., Kinder, La.; University of Louisville (Ky.) School of Medicine, 1907; member of the Louisiana State Medical Society; aged 55; died, September 27, of pulmonary tuberculosis.

John F. Cardwell, Grand Rapids, Mich.; Detroit College of Medicine, 1900; member of the Michigan State Medical Society; aged 66; died, September 24, in the Sparrow Hospital, Lansing, of heart disease.

James Edward Kelly, Jersey City, N. J.; Georgetown University School of Medicine, Washington, D. C., 1925; aged 38; died, September 3, of coronary thrombosis and cardiovascular renal sclerosis.

John Lewis Rawls ✠ Suffolk, Va.; Jefferson Medical College of Philadelphia, 1917; on the staff of the Lakeview Hospital; aged 54; died, September 12, of injuries received in an automobile accident.

William Martin Richards, New York; Bellevue Hospital Medical College, New York, 1898; served during the World War; aged 66; died, September 11, in the Neurological Institute of cerebral embolism.

Jesse Chrisman Horton, Los Angeles; College of Physicians and Surgeons, Los Angeles, 1914; served during the World War; aged 49; died, September 24, in the U. S. Naval Hospital, San Diego.

Obed Yost, Miami Beach, Fla.; Western Reserve University Medical Department, Cleveland, 1892; formerly medical referee of the Equitable Life; aged 70; was drowned, September 27, in Biscayne Bay.

Frank Paine Ramsey, East Jordan, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; aged 66; died, September 19, of carcinomatosis.

George S. Wright, Seattle; Yale University School of Medicine, New Haven, Conn., 1884; aged 78; died, September 18, in the Providence Hospital of injuries received when struck by an automobile.

Robert Lester Paxton, Lemont, Ill.; University of Illinois College of Medicine, Chicago, 1930; member of the Illinois State Medical Society; aged 35; died, September 30, of poison, self administered.

Charles Elston Phillips ✠ Pratt, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1905; county health officer; aged 62; died, September 11, of angina pectoris.

Jenness Morrill, Falkland, N. C.; University of Maryland School of Medicine, Baltimore, 1888; aged 74; died, September 9, of chronic endocarditis, mitral insufficiency and chronic interstitial nephritis.

Morton McTyeire Moss, Bowling Green, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1894; served during the World War; aged 72; died, September 3, of Parkinson's syndrome.

Frederick Irving Brown, Los Angeles; Rush Medical College, Chicago, 1890; formerly instructor in otology at his alma mater; served during the World War; aged 70; died, September 19.

Robert L. Barclay, Kennard, Texas (licensed in Texas, under the Act of 1907); aged 60; died, September 26, in the Jim Smith Memorial Hospital, Crockett, of septicemia and pneumonia.

Samuel Jackson Redman, Dexter, Maine; Medical School of Maine, Portland, 1899; member of the Maine Medical Association; aged 70; died, September 28, of carcinoma of the esophagus.

Marion Dennis Thompson ✠ Pamplico, S. C.; Medical College of the State of South Carolina, Charleston, 1933; aged 31; died, September 28, in the McLeod Infirmary, Florence, of pneumonia.

William Herbert Aykroyd, Toronto, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1903; Manitoba Medical College, Winnipeg, Man., 1913; aged 70; died, August 29.

John J. Stoll ✠ Chicago; Rush Medical College, Chicago, 1885; an Affiliate Fellow of the American Medical Association; aged 78; died, September 22, of uremia and chronic glomerular nephritis.

Robert Eugene Taft ✠ Cleveland; University of Wooster Medical Department, Cleveland, 1898; aged 73; died, September 9, at Shaker Heights of coronary occlusion and diabetes mellitus.

Thomas LeRoy Jefferson, West Palm Beach, Fla.; Meharry Medical College, Nashville, Tenn., 1892; aged 72; died, September 29, in the Pine Ridge Hospital of acute appendicitis.

John McKendree Bailey, Hopewell, Va.; Medical College of Virginia, Richmond, 1924; member of the Medical Society of Virginia; aged 40; died, September 22, of cirrhosis of the liver.

William Wells Brand, Portland, Ore; Ensworth Medical College, St. Joseph, Mo., 1899; served during the World War; aged 66; died, August 27, of arteriosclerosis and heart disease.

Patrick F. Burke, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1894; aged 74; for many years on the staff of the Sacred Heart Hospital, where he died, September 3.

Roscoe Eugene Glass, Tampa, Fla.; Medical College of Virginia, Richmond, 1914; aged 52; died, September 25, in a local hospital of injuries received in an automobile accident.

Madge Dickson Mateer, Tsingtao, China; Homeopathic Hospital College, Cleveland, 1885; a retired medical missionary of the Presbyterian Church; aged 79; died, September 12.

John R. Perry, Marion, Ky.; Hospital College of Medicine, Louisville, 1907; member of the Kentucky State Medical Association; aged 55; died, September 26, of angina pectoris.

Benjamin F. Lyle, Cincinnati; Medical College of Ohio, Cincinnati, 1882; formerly member of the board of education; aged 78; died in September, at the Bethesda Hospital.

Nash Collins, Delhi, La.; Kentucky School of Medicine, Louisville, 1891; member of the Louisiana State Medical Society; aged 69; died, September 12, of myocarditis.

Lelia B. Higgins ✠ Wilton, Maine; Woman's Medical College of Pennsylvania, Philadelphia, 1893; aged 79; died, August 1, of cerebral hemorrhage and myocarditis.

Clinton L. Montgomery, Blue Mound, Ill.; Rush Medical College, Chicago, 1895; served during the World War; aged 72; died, September 20, of coronary thrombosis.

Harvey Weston Turnipseed, Tchula, Miss.; University of Nashville (Tenn.) Medical Department, 1900; aged 68; died, September 16, in the Baptist Hospital, Jackson.

Tristram Bethea Hamer, Carrollton, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1892; aged 68; died, September 6, of cardiorenal insufficiency.

Charles Cyrus Kehl ✠ Seattle; University of Kansas School of Medicine, Kansas City, 1920; aged 48; died, September 21, in St. Luke's Hospital of nephritis.

Isabel M. Davenport, Orlando, Fla.; Woman's Medical College, Chicago, 1891; formerly a practitioner in Chicago; aged 83; died, September 17, of heart disease.

Hiram C. Jones, Logan, W. Va.; College of Physicians and Surgeons, Baltimore, 1889; aged 78; died, September 28, in the Huntington (W. Va.) Orthopedic Hospital.

Job Nelson Statum, Birmingham, Ala.; Southern Medical College, Atlanta, 1888; served during the World War; aged 83; died, September 24, in Kessler, W. Va.

B. E. Huckabee, Birmingham, Ala.; Meharry Medical College, Nashville, Tenn., 1902; aged 75; died, September 1, of cardiac hypertrophy and chronic nephritis.

Jonathan Manning Roberts, Chicago; Columbia University College of Physicians and Surgeons, New York, 1896; aged 68; died, September 6, of chronic myocarditis.

Lewis J. Daniels, Milwaukee; Rush Medical College, Chicago, 1896; aged 65; died, September 20, at the Columbia Hospital of arteriosclerotic heart disease.

William Donaldson McNamar, Jacksonville, Fla.; Western Pennsylvania Medical College, Pittsburgh, 1892; aged 70; died, September 18, of cerebral hemorrhage.

Isaac Clark Woodford Fling, Belpre, Ohio; University of Louisville (Ky.) Medical Department, 1907; aged 62; died, September 3, of coronary thrombosis.

William C. Mack, Indianapolis; Howard University College of Medicine, Washington, D. C., 1914; aged 53; died, September 29, of pulmonary tuberculosis.

Edward Arthur Sherlock, Los Angeles; Syracuse (N. Y.) University College of Medicine, 1921; aged 44; died in September of poison, self administered.

R. S. Pounds, Redan, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; aged 50; died in September of a self-inflicted bullet wound.

Thomas W. Henderson, Augusta, Ark. (licensed in Arkansas in 1907); aged 60; died, September 7, of chronic nephritis and cardiac hypertrophy.

George Cassell Nelson ✠ La Harpe, Ill.; St. Louis College of Physicians and Surgeons, 1910; aged 55; died, September 21, of coronary thrombosis.

Olaf Bentzen, Miami, Fla.; Kongelige Frederiks Universitet Medisinske Fakultet, Oslo, Norway, 1893; aged 67; died, September 16, in a local hospital.

James W. Lambert, Valley Head, W. Va.; University of Louisville (Ky.) Medical Department, 1908; aged 65; died, September 4, of thrombosis.

Arthur A. McCabe, Oklahoma City; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 83; died, September 23, of cerebral hemorrhage.

Thomas J. Hackett, Houston, Texas; Meharry Medical College, Nashville, Tenn., 1913; aged 48; died, September 9, of acute glomerular nephritis.

Charles Henry Phillips Jr., St. Louis; Meharry Medical College, Nashville, Tenn., 1908; aged 57; died, September 29, of hypertensive heart disease.

Jacob Shrader Smith, Bellingham, Wash.; Louisville (Ky.) Medical College, 1898; served during the World War; aged 63; died, September 14.

Morris Schaner ✠ Toledo, Ohio; University of Cincinnati College of Medicine, 1916; aged 50; died, September 28, of acute dilatation of the heart.

James Eliott Blakemore, Van Buren, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1892; aged 76; died, September 14.

Mary Roush Krieger, Cincinnati; American Eclectic Medical College, Cincinnati, 1891; aged 91; died, September 14, in the Bethesda Hospital.

Elmore Estes, Johnson City, Tenn.; Vanderbilt University School of Medicine, Nashville, 1911; aged 61; died, September 28, in a local hospital.

Bureau of Investigation

THE MME. ADELE FRAUD

The Interesting History of Adele Millar's Quackeries

On Jan. 24, 1939, the United States mails were closed to Adele Millar, Adele Millar Prentiss and Francisca of Los Angeles and San Francisco. The case illustrates once more the futility of temporizing with quackery. The story that follows is based on (1) material in the files of the Bureau of Investigation of the American Medical Association, (2) information supplied by the Post Office Department and (3) facts released by the Federal Trade Commission.

The first record that the Bureau of Investigation has of any one known as Adele Millar appears in a clipping from the San Francisco *Call* of July 30, 1911. This was a column-long story of the case of a girl who, according to her friends, "was the unwitting victim of inexpert and bungling" work of a "beauty specialist" concern. The girl—a suicide—the story stated, was abnormally sensitive about her complexion. She went to a physician who refused to do what she asked because of the danger involved in the treatment she desired. She then went, according to the newspaper report, to the Millar Institute, whose proprietor was an Adele Millar. The result of the "treatment" she received so blotched and scarred the girl's face that she disappeared; her body was found later "cast up by the waves at Bolinas beach."

The newspaper story further stated that, coincidentally with the girl's disappearance, Adele Millar's husband gave out that his wife "had gone to Europe for an indefinite stay." The paper, on investigating, reported that the facts were that this Adele Millar had not left the state but was "sojourning incognito at a chicken ranch on the Mountain View road one mile from Petaluma." The paper added: "Her [Adele Millar's] departure for 'Europe' occurred simultaneously with the announcement of the girl's disappearance." The Bureau of Investigation has no record that any action was taken in this case.

The second record that the Bureau of Investigation has of a person of this name was a report from the Board of Medical Examiners of California stating that an Adele Millar was arrested on July 21, 1927, charged with violation of the Medical Practice Act of California. She was arraigned in Division 6, Municipal Court of Los Angeles. She pleaded guilty and was sentenced to pay a fine of $100 or serve fifty days in the city jail. *Sentence was suspended* for two years on condition that she would not violate the State Medical Practice Act during that period.

The third record came about three years later, when Adele Millar was again arrested and arraigned on April 15, 1930, in the same court as before (Division 6, Municipal Court of Los Angeles), charged once more with violation of the Medical Practice Act. Again she pleaded guilty and was sentenced to serve sixty days in the city jail. But *sentence was suspended* for 180 days on condition that she acquaint herself with the law pertaining to her work!

The fourth record came about four years later, when a Post Office fraud order was issued Jan. 4, 1934, closing the mails to "Mme. Adele," of Los Angeles, a trade name used by Adele Millar. At this time she was selling a "Wonder Peel Paste" which she had been advertising four years previously and which contained caustics. Although she represented that her paste was harmless, the Post Office report stated that "expert medical evidence shows that the burning caused by its use is extremely dangerous and complaints in evidence show two actual instances in which death was narrowly averted as a result of such burns." In addition, Adele Millar sold "Beauty Turtle Oil," a "Developing Cream" and a so-called "Skin Tightener"—the usual armamentarium of the beauty-specialist quack. Because these were sold through the mails under fraudulent claims, the fraud order was issued. The Post Office also obtained an indictment against Adele Millar, charging her with using the mails to defraud. She pleaded guilty and was given a *suspended sentence* of two years!

The fifth record is contained in a release issued by another government agency, the Federal Trade Commission, on March 7, 1938—about four years after the first fraud order was issued. The release read in part:

"The Federal Trade Commission has issued a complaint charging Adele Millar, 177 Post St., San Francisco, with misrepresenting the therapeutic value and merit of Wonder Peel Paste, advertised as a treatment for skin ailments and sold in interstate commerce. The respondent trades as Mme. Adele and Chez Adele."

The conclusion of the Commission's case was reported in a release it issued on July 29, 1939, reading as follows:

"The Federal Trade Commission ordered Adele Millar, trading as Mme. Adele and Chez Adele, San Francisco, to discontinue false representations in the sale and distribution of a cosmetic preparation designated "Wonder Peel Paste," or any other similar preparation.

"Under the order, the respondent is prohibited from representing that her preparation will withdraw toxins from the skin, accelerate chemical changes in the living skin cells, or supply materials to the skin to repair waste tissues; that its use will prevent or remove freckles, liver spots or wrinkles; that it will prevent or remove or have any beneficial effect in aiding in the removal of, any blemishes or other conditions of the skin which are due to or persist because of a systemic or metabolic disorder or condition; that it will prevent pimples, blackheads, puffs, scars, pits, acne or crepey neck, and that it has any beneficial effect in aiding in the removal of pimples, blackheads, puffs, scars, pits, acne or crepey neck, unless such representation is limited to those conditions which are of a surface character only.

"The respondent, now known as Adele Millar Prentiss, is also ordered to cease representing that her preparation has any beneficial effect on the metabolism or nutrition of the tissues."

Advertisements (enlarged) from the Los Angeles *Examiner*, August 1925.

The action of the Post Office Department referred to in the first paragraph of this article, closing the mails to Adele Millar, Adele Millar Prentiss and Francisca, was due to her having resumed, under these names, the mail-order sale of her Wonder Peel Paste in defiance of the original fraud order issued against her in 1934. This necessitated the issuance of the supplemental fraud order of January 1939 against the later trade names used by Adele Millar and brings the record of this

individual up to date. All of this must be very amusing to the Adele Millar organization. Certainly it reveals the inability of the authorities concerned to inhibit her activities. The long time which usually passes before the issuing of final orders by federal organizations gives many a promotor opportunity to reap the field before the storm breaks.

Correspondence

"OBSTETRIC SHOCK"

To the Editor:—Dr. Virgil H. Moon has called my attention to the fact that material from his book ("Shock and Related Capillary Phenomena," New York, Oxford University Press, 1938) was used in my article "Obstetric Shock: Its Causes, Recognition and Management" (The Journal, September 23, p. 1183) without due credit being given him. On comparison, to my utter chagrin, I find that Dr. Moon's statement is correct and I am therefore anxious to make amends for this error.

After spending some six or seven months reviewing the general subject of shock, including the few existing articles on obstetric shock, I began to write a paper in the form of an editorial for a chairman's address. Such an article could consist only of a review of the literature, with some practical considerations gleaned from a personal experience of some ten years' interest in the subject. It was a most difficult job, owing largely to the confused state of the vast literature on shock. Work piled up; "time marched on," and I deemed it necessary to obtain the assistance of a ghost writer, to whom I gave all my notes (a voluminous quantity), including an extensive bibliography and a partly written address. In due time he returned the completed article. It did not occur to me to check meticulously every statement as to authorship. I had full confidence that credit would be given wherever necessary for material used. It was not until I received Dr. Moon's letter that I appreciated the fact that my ghost writer had taken many paragraphs in toto from the final chapter of Dr. Moon's monograph, published by the Oxford University Press.

For this error of omission I offer my sincere apology to Dr. Moon and to the Oxford University Press.

Harvey B. Matthews, M.D., Brooklyn.

THE THECA INTERNA CONE: A TEST FOR FOLLICULAR GROWTH AND STIMULATION

To the Editor:—During the meeting of the American Medical Association in St. Louis and since then in meetings of medical societies all over the country, a moving picture has been shown which deals with a new gonadotropic substance recovered from the serum of pregnant mares. In this picture the development of the growing graafian follicle is shown. This part includes the "Theca Interna Cone," giving the name as such but not that of the author.

The author's name is of little importance as soon as the discovery is generally acknowledged. Until this stage is reached, the author's name should be mentioned in moving pictures, as is customary in other forms of medical publication.

My papers dealing with the growth of the graafian follicle and the causes of its ascent to the ovarian surface cover a period of sixteen years of histologic research. The pathologist Prof. Ludwig Aschoff, whose assistant I was from 1921 to 1922, told me to find out why the follicle ruptures. He anticipated that, in addition to the endocrine stimulus, there was a special anatomic mechanism, because other pathologic cystic formations of the ovary almost never rupture even when they reach the size of a man's head.

In my first paper (Why Does the Follicle Rupture? *Arch. f. Gynäk.* **119**:168 [Sept.] 1923) it was shown that the distance between the follicle and the ovarian surface in human beings becomes smaller with the appearance and development of the thecal layers. At the same time it was found that there exists always an eccentric type of growing in follicles, while pathologic cystomas have a concentric way of growing. A one-sided thickness of the theca interna, rich in cells, toward the ovarian surface is present, which in larger follicles is from eight to ten times wider at the upper pole than at the lower pole toward the hilus. The theca externa, on the other hand, rich in connective tissue fibers, stays thick around the lower hemisphere and becomes thin at the upper hemisphere toward the ovarian surface, thus keeping the follicle like a goblet from expanding to any other side but the surface of the ovary. The active growth of the theca interna, which is soft, owing to its richness in fast multiplying cells, provides an area of lower resistance in direction toward the cortex and albuginea.

In a later study (Theca-Interna Cone, the Pathmaker of the Follicle, *ibid.* **158**:628, 1934) it was demonstrated in human and cat ovaries that there was not only a blunt one-sided thickness of the theca interna but a wedgelike theca interna cone with a triangular outline which always points toward the nearest part of the ovarian surface. This thecal cone possesses a tropism toward the surface like the sprout of any seed and plows the path for the follicle by active infiltrating growth through the stroma and the albuginea. The follicle proper follows the line of least resistance thus provided, passively adopting frequently an elliptic or even a cone shape itself.

The theca interna cone can be demonstrated only in serial sections, perpendicular to the ovarian surface, running through the apex of the cone, as geometric considerations easily show. This must have been the reason why it has not been found before in an organ thoroughly examined by many authors for more than a hundred years.

In order to make sure that the theca interna cone was part of the normal histologic and physiologic picture of the ovary, it was necessary to prove its presence in as many mammalian species and orders as possible. This was done together with Erika von Moellendorff (The Theca Interna Cone, a Typical Structure in Growing Mammalian Follicles, *ibid.* **160**:278, 1935). The theca cone could be verified in all mammalian species the ovaries of which we were able to obtain during the estrus and preestrus. In addition to Homo sapiens and cats, the thecal cone was found in horses, cows, swine, dogs and rabbits.

The work was completed at the Mayo Foundation and a final report, based on more than 18,000 microscopic slides, given before the staff of the Mayo Clinic (The Theca Interna Cone and Its Role in Ovulation, *Surg., Gynec. & Obst.* **67**: 299 [Sept.] 1938; abstr., *Proc. Staff Meet., Mayo Clin.* **13**: 443 [July 13] 1938).

The theca interna cone is found only in growing follicles. It disappears when degeneration sets in. It therefore can be used as a test for normal follicular growth and stimulation.

Erwin O. Strassmann, M.D., Houston, Texas.

RABIES

To the Editor: — The report on "Rabies in Birmingham, Alabama" (Drs. G. A. Denison and J. D. Dowling, The Journal, July 29, p. 390) raises several questions that call for further discussion. No one should find fault with the statements of fact in their report; but it is unfortunate that some of the conclusions that they drew were published, because these have already been seized on by enemies of public health work and orthodox medical practice to cast discredit on even such rabies control measures as Drs. Denison and Dowling themselves advocate.

The authors' thesis is stated in the first paragraph of their report: "We are especially concerned with those problems

which confront the physician; namely, the value of antirabies vaccine and indication for its administration." Their intimation that "failure to control the dog" is what calls for other antirabies measures is one with which there is or should be general agreement. The factors that they mention as leading to the "indiscriminate administration of vaccine," as given in the third paragraph of their report, may also be largely accepted as widely prevalent, though the indictment suggested by the word "indiscriminate" is much too strong.

Since the thesis stresses the "problems which confront the physician," it seems strange that in the fourth paragraph of the report the prospective patient is described as being in a state of "such extreme mental anguish that nothing short of vaccine treatment can prevent nervous collapse of the individual"; and yet they go on to say that "the physician too often fails to maintain a professional attitude and allows himself to be influenced by the undue apprehension of the patient." It will surely be agreed that the public should be educated as rapidly as possible so that "undue apprehension" will more and more rarely occur, but this takes a long time, and the health officer or practicing physician who is confronted with an individual so extremely apprehensive as to be in danger of nervous collapse ought seriously to question his own wisdom and "professional attitude" if he refuses to give vaccine. Such persons very often truly believe and violently feel that it is the duty of the health department to give them the vaccine, and refusal to give it leads to loud criticism freely voiced among friends and neighbors. Facing such a situation, the health officer would injure his department vastly more in the mind of the public than he could possibly gain in any way by refusing the treatment. What the influence of such an attitude on the part of a practicing physician would be on his practice is left to the physician to judge.

As to statistical data given in the report, no question is raised; but one obvious conclusion regarding the effectiveness of canine vaccination was not drawn. If the incidence of rabies among all dogs belonging to white owners was 1.5 per cent, while the incidence among vaccinated dogs (40 per cent of the whole group) belonging to white owners was 0.5 per cent, this would indicate that about 75 per cent of vaccinated dogs were protected by the treatment.

The mortality of 0.06 per cent among 42,947 persons who received antirabies vaccine may be compared with the average mortality figure of 0.36 per cent given in League of Nations data concerning persons treated after being bitten by known rabid animals. The authors do not state the proportion of the 42,947 persons who are known to have been bitten by rabid dogs, but if it was only one in six their data would be as good evidence for the use of antirabies vaccine as are the League of Nations data.

It is difficult to see how the conclusion "The persistence with which fatalities continue to be equally distributed among the treated and untreated" can be drawn from the fact that twenty-three of the forty-eight fatal cases had received supposedly adequate treatment. Such a conclusion could logically follow only if the number of untreated persons bitten by known rabid animals was approximately equal to the number of treated persons known to have been so bitten. No definite data are given to substantiate any such assumption. Such data should not be hard to collect if they exist, for while it is never possible to obtain reports of all dog bites it is always possible to trace what happens to those people who refuse treatment after it is found that they have been bitten by known rabid dogs, which class after all is the criterion of susceptibility to rabies.

The argument based on the comparative number of deaths among Negroes and white persons from some points of view has some weight, but even here there are other variable factors that have not been taken into consideration. For instance, the statement that "Negroes undoubtedly are bitten and otherwise exposed to rabies as often as the white persons" is an assumption not susceptible of proof from the data given; the very fact that "their animals are subject to the poorest of care" would leave the Negroes' dogs in most instances free to follow the frequently observed tendency of a rabid dog to run away from home and bite other dogs, while the well cared for dog belonging to the white family would be much more likely to be observed and handled in the early stages of the disease, resulting in bites of the owner or members of his family. It is in "caring for" his dog that the owner of a rabid animal is most often bitten.

It is claimed, therefore, that the following quoted statement is seriously open to question: "In the experiences cited there is little relation between mortality from rabies and the administration of antirabies vaccine, for (1) among the highly exposed untreated (Negro) population fatalities are no greater than among the highly exposed treated (white) population, and (2) such rare fatalities as do occur are equally distributed among the treated and the untreated."

If the authors really believe this twofold assertion, it is difficult to see why they advocate giving antirabies vaccine at all. It is indeed surprising to read through the rest of their report and find them recommending a rabies control program practically identical with that in effect in other parts of the country where rabies is a problem and to note that in Birmingham in 1938 the ratio of antirabies treatments to the number of known rabid animals was 2.9. In Los Angeles County, another rabies focus, this ratio was less than 2.0.

Some further Los Angeles County data on cases of human rabies may be of interest. In this county it is not often that a person refuses treatment after it is found that he has been bitten by a rabid dog, and the force of pound men and quarantine officers on the job do not fall far short of finding all dogs that become rabid and tracing all persons bitten by them. In a recent two year period there were five deaths from human rabies. In three of the five cases treatment was neglected, one reason being that two of the bites were not reported till the persons became ill. One of the dogs concerned was a pup which was killed by its owner after it had bitten his child. Another was not known to have bitten any other person and was never found. One bite was recognized soon after it occurred, but the person bitten was intoxicated and careless and did not heed the health department's counsel to take antirabies vaccine. In the fourth case the treatment could not be considered adequate in view of the location and type of the bite. In the fifth an adequate dosage of vaccine was given, but it was vaccine of local manufacture and not generally approved.

In passing, it should be noted that as yet no standard method of determining the potency of antirabies vaccine on the market is in effect. This defect in procedure is one that should be remedied, and until it is one may expect too frequent failures of the vaccine to protect. Even when all possible tests are made, however, we do not yet have a perfect vaccine for any disease; but this is not considered a valid argument against using vaccines.

All should certainly agree with the authors' first sentence in their conclusion: "The data presented are not of a type to warrant definite conclusions." It is to be regretted that they apparently came near reaching such conclusions, or at least expressed themselves in such a way as to put unwarranted weapons into the hands of people who delight in attacking health officers and the public health program.

J. L. POMEROY, M.D.
H. O. SWARTOUT, M.D., DR.P.H.
Los Angeles.

County Health Officer and Director of the Bureau of Communicable Disease Control, respectively.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ALLERGY TO COLD

To the Editor:—**A woman aged 53 had a hysterectomy and roentgen therapy following a diagnosis of carcinoma of the cervix nine years ago. Physical examination reveals obesity, apparently from a familial trend, and blood pressure of 180 systolic and 110 diastolic but otherwise essentially normal conditions. The urine is normal and the hemoglobin is 70 per cent. She is highly nervous and requires phenobarbital to sleep. On Aug. 13, 1939, she was washing cucumbers in cold water and developed, after about ten minutes' exposure, a diffuse swelling of the hands accompanied by itching and burning. This was relieved by the injection of 0.5 cc. of a solution of epinephrine hydrochloride. On August 15, while standing outdoors in a sleeveless dress in a cool wind, she felt an itching of the flexor surfaces of the forearms and presently developed urticarial wheals in these areas. At a later date the ingestion of an ice cream cone caused gross rapid edema of the upper lip and tongue, as did contact with ice cubes in an iced drink. The application of an ice bag for nosebleed caused, in twenty minutes, edema of the eyelids and forehead to the extent that she could not open her eyes. This edema responds to epinephrine and ephedrine but the injection is followed by severe headache, presumably due to the hypertension. There is no history, either personal or familial, of allergy of any type prior to August 13. Could you offer me any suggestions or literature as to the management of such a case during the coming winter months? Her financial status would prevent the patient's removal to a warmer climate.** **A. H. Field, M.D., Randolph, Minn.**

ANSWER.—This is an undoubted case of hypersensitiveness to cold. In addition, another type of allergy (such as food allergy) may be present. Several methods have been employed in the treatment of cold allergy. One consists simply of systematic exposure to low temperatures in order to build up tolerance. This may be accomplished by daily cold showers or baths followed by a warm shower if the reaction is undesirable. A brisk ice rub followed by treatment with a heat lamp is recommended by some (Duke, W. W.: Physical Allergy as a Cause of Dermatoses, *Arch. Dermat. & Syph.* **13**:176 [Feb.] 1926). Another method of exposure to cold is advised by B. T. Horton and G. M. Roth (Collapse While Swimming: The Most Dangerous Consequence of Hypersensitiveness to Cold, *Proc. Staff Meet., Mayo Clin.* **12**:7 [Jan. 6] 1937). It consists of immersion of a hand in water at 10 C. for one to two minutes twice daily for three or four weeks. However, this method is probably more useful in the type of cold hypersensitiveness in which constitutional histamine-like effects are prominent.

In recent years considerable attention has been given to the relationship of histamine to allergy and particularly to cold hypersensitiveness. Treatment with histamine has been recommended on the basis that the reaction phenomenon will be exhausted. Thus, G. W. Bray (A Case of Physical Allergy: A Localized and Generalized Allergic Type of Reaction to Cold, *J. Allergy* **3**:367 [May] 1932) cited a case of cold allergy in a boy who was relieved by daily histamine injections beginning with 0.1 mg. and increasing to 1 mg. It is felt, however, that these doses are excessive. Horton and Roth recommended injections of histamine in doses of 0.1 mg. or less twice daily for two to three weeks.

More recently (Roth, G. M., and Horton, B. T.: Hypersensitiveness to Cold; Treatment with Histamine and Histaminase: Report of Case, *Proc. Staff Meet., Mayo Clin.* **12**:129 [March 3] 1937) histaminase has been used in the treatment of cold hypersensitiveness. A dose of from 5 to 10 units three times daily, taken by mouth, is the usual procedure. The function of the histaminase is to detoxicate the excess of histamine formed in the tissues.

TUBERCULIN TREATMENT FOR TUBERCULIDS

To the Editor:—**Will you please tell me the exact method of administering old tuberculin in the treatment of rosacea-like tuberculid (Lewandowsky)? I wish to start with a 1: 10,000,000 dilution.** **M.D., New York.**

ANSWER.—"Exact" is not an appropriate term for tuberculin therapy, for each physician has his own technic and each patient reacts in a different way and must be managed differently. Most users of tuberculin therapy test the sensitivity of the patient by the Mantoux intracutaneous test and begin treatment with a subcutaneous injection of an amount slightly less than that producing a reaction. Once or twice a week this dose is repeated for a few times; then, if no reaction has been caused, the amount of tuberculin is increased cautiously and this dose is repeated several times. From 10 to 100 per cent increase is made depending on the physician's judgment of the patient's tolerance.

The patient, if ambulatory, is instructed to take his temperature three times daily and to record it and any symptom that he may notice. At the interview with his physician these data are discussed and evaluated.

It is the present practice to use sterile physiologic solution of sodium chloride for diluting tuberculin, without the addition of phenol. If sterile, the dilutions keep their strength for some time. Great care must be used in cleansing the implements in which tuberculin has been used, for a minute amount of one of the stronger solutions can alter the dose of a weak solution materially. Many workers keep special syringes and needles for the dilute solutions. These are cleansed and boiled in distilled water.

H. S. Burnell-Jones (Tuberculin in the Treatment of Cutaneous Disorders, *Brit. M. J.* **1**:1212 [June 15] 1935) advises two doses a week for the first few weeks, then one a week, increasing 10 per cent when there has been no reaction. He depends on a general reaction, counting a rise of temperature to 99 F. as such. He does not approve local reactions and in order to avoid them he injects between the shoulders, where the skin is less liable than that of the arm or leg to give local reaction. He places great value on a rest period of from six to eight weeks now and then during a course of treatment, which he thinks gives the tissue cells a chance to recuperate from the repeated stimulation of tuberculin.

Other measures to increase the patient's resistance and to facilitate local healing must not be neglected. In fact, many authorities consider tuberculin an adjuvant to other therapeutic measures rather than the chief factor. For the tuberculin treatment the motto must be "Make haste slowly."

BUTADIENE, ISOPRENE AND PIPERYLENE

To the Editor:—**Will you please inform me of any possible dangers of both acute and chronic forms to daily exposure to the following volatile hydrocarbons: butadiene, isoprene, piperylene. The patient uses no masks and has come in contact with concentrated vapors of the gases for the past two years but to date has noticed only nausea after exposure.** **Leon Miller, M.D., Philadelphia.**

ANSWER.—At this time these chemicals are used principally in the production of plastics, synthetic rubber and rubber-like substances. The destructive distillation of natural rubber yields some isoprene. Conversely, the polymerization of isoprene may lead to a product resembling natural rubber. Butadiene, when polymerized, may furnish "Buna" rubber, likewise resembling natural rubber. All of these substances, as a result of fairly simple chemical or physical manipulations, furnish a wide variety of new compounds not all of which can be predicted. If isoprene is merely allowed to stand for a few weeks, new physical properties may arise. In the freshly prepared state, none of these three mentioned chemicals are highly toxic. All are mild narcotics. All are irritants to the mucous membranes. Such actions are acute. By way of chronic changes, emphysema may be produced. Larionov and his co-workers (*Kazanskiy med. zhur.* **30**:440, 1934) found that the minimal lethal dose of butadiene for mice through the inhalation of vapors is from 200 to 300 mg. per liter of air. For isoprene, the corresponding killing dose is 140 mg. At autopsy, pathologic change was limited to the respiratory tract; no changes were associated with the heart, liver or kidneys. The physiologic properties of the polymers and compounds of these substances are little known except in the case of chlorinated butadiene (chloroprene). Von Oettingen and associates (*J. Indust. Hyg. & Toxicol.* **18**:240 [April] 1936) reported toxic action of chloroprene when administered to laboratory animals. Of their subcutaneous series they stated: "The smallest dose which could be administered was 0.001 cc. per gram and this killed 100 per cent of the animals within three and one-half to four and one-half hours." By inhalation, as little as 0.3 mg. per liter was injurious. The pathologic features disclosed included pulmonary irritation, pulmonary edema, cardiac impairment, dilated visceral blood vessels, gastro-enteritis, nephritis, cutaneous irritation and loss of hair. These severe manifestations are to be associated with the introduction of the chlorine ion rather than with the butadiene nucleus itself, since the earlier cited data indicate a far lower toxicity for the unchlorinated substance.

While it is possible to rate the substances mentioned in the query as of a comparatively low order of toxicity, they are not wholly inert and the guiding data are meager. For the time being, at least, exposure to high concentrations of vapors should be avoided.

DIFFERENTIAL DIAGNOSIS OF ASCITES

To the Editor:—**A 34 year old colored man, apparently in good health, bent down while working and when he suddenly straightened up felt "something snap" in his abdomen in the midline below the umbilicus. There was no pain. About six hours later his abdomen was distended, and it remained so for three months, till operation, except for some lessening of distention by the use of salyrgan. There was some pain in the right lower quadrant, the cause of which was diagnosed in office fluoroscopy as a ruptured muscle. His only other symptoms were some frequency and urgency. Physical examination was negative except for rounded abdomen, which had all the characteristics of ascites. There were a positive Wassermann reaction, negative spinal fluid examination and negative blood count and blood chemistry; gastric analysis showed free hydrochloric acid of 50 and total acidity of 63; urinalysis showed occasional pus cells; x-ray examination gave results "indicative of fluid in the peritoneal cavity." Exploratory operation showed all organs to be in good condition and an extraordinarily well developed abdominal musculature. There was no mention of the fluid withdrawn, and a tentative diagnosis of tuberculous peritonitis and syphilitic crisis was made. Can you tell me what relationship there could be between the "injury" and the sudden development of ascites? Is there such an entity as syphilitic peritonitis? Could the syphilis have been aggravated to cause ascites by virtue of hepatic cirrhosis? Can you give me any other possible diagnosis?**

M.D., Pennsylvania.

ANSWER.—This question involves the differential diagnosis of ascites. It is assumed that the exploratory laparotomy demonstrated that the distention was due to ascites, although the question does not so state. Among the common causes of ascites are circulatory disturbances, renal disease, hepatic obstruction, leukemia, Hodgkin's disease, neoplasm and tuberculosis. Syphilis as a rule causes ascites only by producing a perihepatitis or other hepatic obstruction. This and hepatic obstruction for other causes seem ruled out by the statement that "exploratory operation shows all organs to be in good condition." The same statement fairly well rules out abdominal neoplasm with ascites. Circulatory failure is incompatible with the history, and renal or blood disease does not fit in with the laboratory observations. Hodgkin's disease seems unlikely but should be kept in mind.

To correlate the sudden appearance of ascites with the injury is a difficult problem. It must be remembered that from 1.5 to 2 liters of fluid may be present in the peritoneal cavity without physical signs and that from 4 to 5 liters will cause no great distention. It is difficult to imagine what sort of "injury" could cause the accumulation of more than 5 liters of fluid within six hours and leave no traces that could be found at exploratory laparotomy three months later. It seems much more likely that fluid was already present in the abdomen at the time of the "injury." Indeed, the sensation that "something snapped" may have been a sudden shift of the fluid from one portion of the abdomen to another.

Tuberculous peritonitis seems to be the most likely diagnosis. An x-ray examination to investigate the possibility of pulmonary tuberculosis would be helpful. The injection of some of the fluid into a guinea pig might easily settle the question.

TOPICAL ANESTHETICS

To the Editor:—**Will you kindly send me information concerning so-called topical anesthetics? I have read conflicting statements concerning ethyl aminobenzoate U. S. P. (benzocaine), for example, as to its efficacy in relieving painful superficial burns. There are several preparations which are claimed to have a local anesthetic effect in the relief of superficial burns and localized pruritus. Which of the anesthetics used are most effective on cutaneous surfaces, and are these absolutely nontoxic and safe to use over a large area, even in young children?**

M.D., New York.

ANSWER.—There is no absolutely nontoxic and safe topical anesthetic. Ethyl aminobenzoate (benzocaine) was discovered before orthoform but did not come into prominence until the dangers inherent in the use of orthoform had become known. L. Schwarzschild (Sensibilisierungs Versuche aus der Orthoform Reihe, *Arch. f. Dermat. u. Syph.* **156**:432, 1928) reported two cases of severe dermatitis due to ethyl aminobenzoate (anesthesin) in 1928. His study of the sensitizations produced by members of this group of drugs convinced him that these effects were caused by certain chemical subgroups. M. H. Goodman (Cutaneous Hypersensitivity to the Procaine Anesthetics, *J. Invest. Dermat.* **2**:53 [April] 1939), as a result of his recent investigations, comes to the same conclusion.

Butesin picrate in ointment form is widely used in the treatment of burns and is a common cause of dermatitis.

The possibility of sensitization and a dermatitis which may become much more disabling than the original burn is not the only harm that such drugs may do. Bernard Fantus and H. A. Dyniewicz (Compound Solution of Tannic Acid, THE JOURNAL, July 17, 1937, p. 200) warn against the use of the tannic acid treatment for small burns because of the damage done to skin cells and the resultant delay in healing. They state that the tannic acid method is applicable only to large burns that threaten serious systemic effects.

The soothing effect of protection from the air, such as can be produced by covering the area with melted sterile paraffin, is usually sufficient without the use of local anesthetics. If not, it may be preferable to use a general sedative rather than a local one.

Most of the topical anesthetics are effective only on surfaces from which the epithelium has been removed. Béla Freystadtl (Experimenteller Nachweis der Penetrationsfähigkeit einige Oberflächenanästhetika durch die unversehrte Haut, *Dermat. Wchnschr.* **106**:73 [Jan. 15] 1938) after extensive experimentation found that pantocain in ointment will penetrate the unbroken skin and cause anesthesia, but only after hours of application. He also found that the repeated use of these ointments caused dermatitis. Phenol in 2 per cent water solution caused slight anesthesia in five minutes, dulling the appreciation for cold but only slightly for touch and having no effect on the feeling for pain or warmth. Solutions of phenol in alcohol, glycerin or oil were much less effective. Tricresol, a 2.5 per cent solution in water, was less active than the phenol solution in water, and 10 per cent alcoholic solution of beta-naphthol, salicylic acid, guaiacol and resorcin had less effect, decreasing in the order in which they are named.

Since phenol, even 1.5 per cent watery solution applied as a wet dressing, is credited with causing gangrene, most dermatologists do not use it any stronger than 0.5 per cent in water and 1 per cent in the other solvents. Sensitization to phenol is much less common than is that to the more complex drugs previously discussed.

DIAGNOSIS AND TREATMENT OF NERVE INJURY

To the Editor:—**I have a case of radial and ulnar nerve injury of the left forearm and hand region with what is apparently physiologic solution of continuity without anatomic interruption of the nerve pathways. It is desirable to study the reaction of degeneration in the involved muscles in order to throw light both on exact diagnosis and on prognosis. Please comment on the efficacy of electrical stimulation of the involved muscles of the forearm as a therapeutic measure. Can you advise me concerning the purchase of an apparatus which will supply galvanic and faradic current and cathode and anode opening and closing currents?**

M.D., Ohio.

ANSWER.—In the study of paralyzed muscles one requires only a source of galvanic and faradic currents. Such an apparatus can be purchased from several firms which deal in electrical supplies. If the nerve is completely degenerated, one will obtain no reaction to faradism from the nerve or muscle, and the galvanic reaction of the muscle will be slow and well sustained. If there is no degeneration of the nerve, both faradic and galvanic stimuli will give prompt contraction when applied to the muscle and to the nerve. If the nerve is not degenerated, one expects a prompt and complete recovery in most cases. If it is degenerated, improvement will be slower and usually stops short of complete recovery, since many regenerating axons go astray and exercise no useful function.

Electrical stimulation has little if any therapeutic value in cases of peripheral nerve paralysis. Denervated muscles should be placed at rest in splints in such a position as to secure relaxation. Stretching and probably contraction of denervated muscles cause serious injury to the muscle fibers and at least delay recovery. The principles of treatment are identical with those employed in the treatment of cases of infantile paralysis.

LACQUER THINNERS

To the Editor:—**I should appreciate information concerning the ingredients of and the toxicity of "Qualalacq Thinner No. 631." This product is manufactured by the Qualatone Products, Inc., 21 Gay Street, New York City. It is used as a varnish thinner by furniture manufacturers.**

M.D., New Jersey

ANSWER.—At the present time, two types of thinners enjoy wide use for general coating purposes. The best thinners consist chiefly of toluene or xylene or mixtures of the two, together with either hydrogenated naphthas or natural petroleum fractions closely similar to the hydrogenated naphthas. A second class of thinners, and that most likely to be used with lacquers and on most furniture, contains in addition to the substances mentioned such materials as butyl acetate, isopropyl acetate, butyl alcohol, ethyl alcohol or closely related substances in the same series. In addition, special thinners may contain small quantities of antiblooming agents, turpentine, benzene and the like. These statements, both as to constituents and toxicity, apply to thinners in general and to no specific product.

All these substances possess some degree of toxicity. Benzene, if present, is the most toxic of the possibilities mentioned.

Toluene is less dangerous than benzene, but this is due partly to its higher boiling point. Butyl alcohol is more dangerous than ethyl alcohol, although the ethyl alcohol may be denatured with 5 per cent methyl alcohol. Full information does not exist with regard to the toxicity of hydrogenated naphtha, and at the present time it is customarily classed as of the same order of toxicity as petroleum naphtha. Some claims have been made that hydrogenated naphtha may contain up to 18 per cent of cyclic compounds. To the extent that this is true, hydrogenated naphtha is to be respected more than naphtha. The acetates represent the constituents of least toxicity but are capable nevertheless of inducing mild conjunctivitis, respiratory irritation and similar abnormality. Thinners of almost any type are capable of inducing dermatitis, either through direct irritation or fat removal. It is always desirable that no workroom atmosphere contain high concentrations of the vapors of thinners. In coating operations, exhaust systems are customarily desirable or necessary, and in addition in some workplaces respirators or helmets may be found in use.

SULFANILAMIDE, NICOTINIC ACID AND METHYLENE BLUE

To the Editor:—**My experience with the use of large doses of sulfanilamide is confined principally to the treatment of gonorrhea. Some of my patients have complained of shortness of breath on exertion (due to methemoglobinemia?). Hartmann advises from 1 to 2 grain (0.065 to 0.13 Gm.) doses of methylene blue every fourth hour for the prevention of methemoglobinemia. Not all observers agree that cyanosis and methemoglobinemia are associated; in addition, methylene blue tends to cause nausea but may be given in enteric coated capsules. There are also a few observers who do not believe that sodium bicarbonate is necessary. Finally nicotinic acid seems to be of distinct value. At this rate I would want to give my patients (*a*) sulfanilamide, (*b*) nicotinic acid, (*c*) sodium bicarbonate and (*d*) methylene blue. If such a scheme is followed, would it be desirable from the standpoint of possible incompatibility to space these drugs, say, one drug every hour; or is there no incompatibility?**

M.D., Pennsylvania.

ANSWER.—No evidence is available on which to base an opinion as to whether or not incompatibility would develop from the simultaneous administration of sulfanilamide, nicotinic acid, sodium bicarbonate and methylene blue. In considering the combination of sulfanilamide and methylene blue it might be well to review the work which has been done on relieving cyanotic symptoms originating from sulfanilamide therapy by methylene blue (*J. Clin. Investigation* **17**:699 [Nov.] 1938; **18**:179 [March] 1939). The rationality of adding nicotinic acid and sodium bicarbonate at the same time is not experimentally and clinically established. It would seem better that the drugs, if indicated, be given concurrently.

DEATH OF EPILEPTIC PATIENT FROM LOCAL ANESTHESIA

To the Editor:—**A white man aged 32, in excellent physical condition with the exception of existing epilepsy, was prepared for a hemorrhoidectomy. The surgeon used what he considered 1½ ounces of 2 per cent procaine hydrochloride prepared by a graduate nurse. One cc. of a solution of epinephrine hydrochloride was added to the procaine hydrochloride before infiltration of the hemorrhoidal area. Just as the surgeon commenced to remove the first hemorrhoid, the patient complained of nervousness, developed a horizontal nystagmus, had five convulsions (clonic type) one after the other and died on the table. The cause was considered respiratory, the breath becoming progressively weaker in spite of the use of artificial respiration. The patient was treated with phenobarbital, receiving one 1½ grain (0.1 Gm.) tablet daily, and had on an average from two to five seizures a month but never status epilepticus. The head and upper extremities were violaceous after death. Investigation revealed that the nurse had made up 45 cc. of 2 per cent pontocaine hydrochloride solution in place of 2 per cent procaine hydrochloride, and this was used for infiltration. Would you consider the pontocaine hydrochloride the primary cause of death?**

M.D.

ANSWER.—The symptoms preceding death are characteristic of the effects of cocaine derivatives on the central nervous system. They occur when the quantity of solution exceeds the limit of safety, when the concentration of the drug is too high or when an inadvertent intravenous injection has been made. In this case, 45 cc. of a 2 per cent procaine hydrochloride solution might well be too high a concentration to use for infiltration anesthesia; if the solution injected was pontocaine hydrochloride in the same concentration, this far exceeds the limit of safety, as pontocaine hydrochloride is used in 1:1,000 to 1:500 dilutions for infiltration. The correspondent does not mention the concentration of the pontocaine hydrochloride solution.

It is usually considered unwise to operate on epileptic patients under local anesthesia, as they may develop convulsions on the operating table unless they are well premedicated with barbiturates or bromides. As the convulsions due to an overdose of the local anesthetic are due to cortical irritation, it is conceivable that the brain of an epileptic patient may be more sensitive to such intoxication than a normal brain; however, death here occurred almost certainly as a result of too much of the anesthetic or because of an intravenous injection. The latter may cause fatality in comparatively small doses.

XEROSTOMIA

To the Editor:—**A woman aged 65 who is generally much debilitated has chronic gallbladder disease and is suffering greatly from xerostomia (dry mouth). The tongue is quite red and beefy in appearance, the lips are cracked, and voice production or articulation is difficult owing to a dryness felt in the esophagus and mouth. The blood picture is normal. I have been giving large doses of liver (Reticulogen Lilly) intramuscularly, 1 cc. weekly for four weeks, without any relief. Her general physical condition is decidedly under par. There is moderate arteriosclerosis with a mild hypertension. The nose and throat are otherwise negative. She has both upper and lower dental plates. Stomach analysis shows anacidity. Therapy other than liver has included brewers' yeast tablets, diluted hydrochloric acid and moderate doses of digitalis for tachycardia. Any information you can give as to relief of dry mouth will be greatly appreciated.**

M.D., Westmoreland, Kan.

ANSWER.—Xerostomia, or deficient salivary secretion, is an accompaniment of diabetes mellitus, diabetes insipidus, belladonna poisoning, severe fevers and nephritis. All dehydrated states are affected to a certain extent. While the condition is rather rare, all too often no assignable cause is demonstrable. In the absence of a specific cause, symptomatic treatment is resorted to with indifferent results. Glycerin mouth washes give some relief. Small doses of pilocarpine sometimes stimulate salivary secretion.

To discuss the possible causes of the fissured lips and the red tongue, apart from xerostomia, would carry the discussion from such local causes as eczema oris through a tremendous number of conditions up to a general nutritional deficiency such as pellagra or sprue. In the case cited, liver extract will not do much in the presence of a normal blood picture. Digitalis is usually ineffective in tachycardia that is not associated with heart failure. Anacidity is not uncommon at age 65 and hydrochloric acid may give symptomatic relief. Brewers' yeast may be useful.

A most careful search for a local or systemic cause should be pursued. If such search proves fruitless local treatment, unsatisfactory as it is, must be kept up.

GASTROINTESTINAL MELANOMAS

To the Editor:—**Are melanomas ever primary in the gastrointestinal tract? How commonly are melanomas found in the gastrointestinal tract? How commonly are melanomas a cause of intestinal obstruction?**

M.D., New York.

ANSWER.—Melanomas can be primary in the gastrointestinal tract. They occur almost exclusively in the rectum. According to Ewing (Neoplastic Diseases, ed. 3, Philadelphia, W. B. Saunders Company, 1928, p. 935) they constitute about 2 to 3 per cent of all melanomas. Of 266 malignant melanomas reviewed by Affleck (*Am. J. Cancer* **27**:120 [May] 1936), only one such lesion was found in the mouth and in the rectum, respectively. Gerritzen (*Arch. f. klin. Chir.* **178**:400 [Dec. 15] 1933) stated that seventy-two cases of primary melanoma of the rectum were reported up to 1934. Forty-eight of these actually were primary melanosarcomas of the rectal mucous membrane, whereas the remaining twenty-four consisted of primary melanosarcoma of the anus and melanocarcinoma. This author added an additional case of rectal melanosarcoma to those already reported. Such tumors are found less frequently in the intestine and occasionally in the gallbladder, bile ducts, esophagus and mouth. Of course, in the presence of all melanomas situated in the last-mentioned sites, the question always arises as to whether they are primary or secondary manifestations. Melanomas are infrequently a cause of intestinal obstruction, partly because of their comparative rarity and partly because the majority of them are situated in the rectum. In a case of multiple primary melanomas of the small intestine reported by Menne and Beeman (*Am. J. Digest. Dis. & Nutrition* **3**:786 [Dec.] 1936) there was no clinical evidence of obstruction prior to the operation. Maxwell (*M. J. Australia* **2**:656 [Nov. 24] 1928) reported a case in which chronic intestinal obstruction and intussusception were the results of secondary melanomas of the small intestine.

An adequate bibliography may be compiled from the references to the literature in the textbook or in the articles of the authors cited.

PUPILLARY ATONY WITHOUT SYPHILIS

To the Editor:—An examination of a veteran airline pilot reveals abnormal pupillary responses in that the pupils react sluggishly to light. Under strong light stimulation the pupils contract from 7 mm. to 4 mm. In the act of accommodation the pupils contract properly. Complete neurologic studies, including an examination of the blood and spinal fluid, yielded negative results. This pilot, at the end of frequent long flights and for a long period, has used a proprietary eye wash to relieve symptoms of mild eye irritation. The manufacturers of the eye preparation state: "This is a neutral and isotonic solution of boric acid and borax, containing 0.4 per cent antipyrine for its slightly anesthetic effect (see Sollmann, 'Manual of Pharmacology,' 5th ed., Saunders); small quantities of cherry laurel water and sodium salicylate are added as perfuming and preserving agents." Would a preparation such as this give false impressions as to pupillary responses?

Ralph Greene, M.D., Coral Gables, Fla.

ANSWER.—It seems unlikely that the use of the proprietary wash mentioned could have any influence on the normal pupillary action. However, it is barely possible that the pilot may be unduly susceptible to the influence of antipyrine, which is known to diminish muscular contractility (Bastedo, W. H.: Materia Medica, Pharmacology, Therapeutics and Prescription Writing, Philadelphia, W. B. Saunders Company, 1937).

It is more probable that this comes under the heading that Behr describes as "reflektorische Pupillenstarre bei nicht metaluetischen Erkrankungen" (pupillary atony without metasyphilitic disease). See Behr, C. J. P.: Die Pupille in Hermann and Wilbrand, Saenger: Neurologie des Auges, Ergänzungs Band, pages 181-197. It must be remembered also that the pupillary responsiveness to light is lost only gradually in syphilis.

AN INJECTION METHOD FOR VARICOSE VEINS

To the Editor:—In the three volume work entitled "Post-Graduate Surgery," edited by Rodney Maingot, there is a discussion of the injection treatment of varicose veins. A technic called "twin injections" is described in which quinine-urethane and a solution called lithocaine are injected simultaneously. Lithocaine is described as lithium salicylate 30 per cent, tutocain 1 per cent. Will you please tell me whether any one else has used these substances with the same degree of success as Maingot and, if they are used with the described consistently superior results, where they may be purchased?

M.D., Texas.

ANSWER.—The twin injection method of Maingot and Harvey has been used in several thousand cases by the authors, who reported no unpleasant sequels and no pain. It seems unnecessarily complicated and requires two operators. No further reports in the literature are available. The solution could be made up by any chemical supply house; tutocain, a derivative of procaine hydrochloride, is not a harmless drug when injected intravenously.

HEMORRHOIDS IN INFANT

To the Editor:—Please advise me of the proper treatment of hemorrhoids in an infant aged 1 year. This child until recently had a persistent constipation and her stool was always large and hard. At the age of 9 months she had an anal fissure which lasted several weeks, after which a single hemorrhoid developed. At present she is having a daily bowel movement and takes liquid petrolatum daily. In spite of this the first portion of each stool is large, hard and inspissated. However, the mechanical action of the liquid petrolatum enables its passage without pain. Would you advise substitution of some hydrophilic substance for the oil?

M.D., Michigan.

ANSWER.—Hemorrhoids in an infant of 1 year practically never require surgical treatment. Constipation should be relieved and the stool kept soft and lubricated so as to avoid pain and irritation of the hemorrhoid on passage. Liquid petrolatum given daily usually suffices to accomplish this. If it does not there is no harm in using liquid petrolatum suspensions. The diet should also be so arranged as to avoid constipation, i. e., with sufficient fruits, vegetables and laxative carbohydrates such as honey, lactose baby jams or corn syrups.

OSTEOMYELITIS IN MILKER

To the Editor:—Is there any danger in employing a farmhand who has a chronic osteomyelitis of the lower part of the leg to milk cows? Is there much likelihood that the organisms producing the osteomyelitis will produce intestinal or other symptoms if the milk is contaminated?

M.D., New York.

ANSWER.—It is probable that the danger of contamination of milk by a farmhand with chronic osteomyelitis of the lower part of the leg who is milking cows is fairly remote. Nevertheless, the possibility does exist that organisms from the infection might gain access to the milk. Furthermore, such organisms could produce intestinal or other symptoms if the milk was contaminated with them.

Practically, milk ordinances in general do not prohibit milking by a person with such an infection. If the milk so produced is not to be pasteurized, it would probably be better to prohibit milking by this man. He certainly should not be allowed to milk cows for the production of milk which is to be distributed raw.

PLASTIC SURGERY OF FACE

To the Editor:—I should like to buy a profilometer used or devised by Josephs, of Berlin, for measuring the profile of the nose in relation to the face. I have tried every store in New York without success. Would you please advise me where I can obtain this instrument and other plastic instruments for nose plastic work. Would you advise me whether there are any new books on plastic surgery.

M.D., Pennsylvania.

ANSWER.—A description of Dr. Joseph Safian's profilometer is found in his book "Rhinoplastic Surgery"; Dr. Safian was a student of Josephs. This has never been put on the market; one could have it made. Dr. C. L. Straith in Detroit uses one which could be duplicated. A celluloid triangle of 30 degrees held in such a way that one may view the profile is the simplest of all these.

Dr. Ferris Smith, Grand Rapids, Mich.; Dr. Earl C. Padgett, Kansas City, Mo.; Dr. Joseph Safian, Dr. Arthur J. Barsky and Dr. J. Eastman Sheehan, New York, and Dr. Edmond B. Spaeth, Philadelphia, are among those who have recently written treatises on plastic surgery.

HERNIA IN INFANT

To the Editor:—At what age would you advise operation on an infant with an indirect inguinal hernia that goes into the scrotum when the baby cries? He has had this hernia since the age of 6 months and is now 1½ years old. A well fitted truss has not helped the situation, although he has been wearing one for the past six months. Also please give me your opinion on the injection, or sclerosing, method of treating a hernia in an infant of this age.

C. A. Eisner, M.D., Pittsburgh.

ANSWER.—Except in case of strangulation or incarceration it is a wise policy to postpone operation for hernia in an infant until he has reached the age of about 2 years, first because (1) the structures have by that time become well enough developed to make operation simple and easy and (2) before that period a baby ordinarily has not acquired habits of cleanliness and therefore the likelihood of infection of the wound has to be seriously considered.

In the specific case referred to, operation had best be done even though the child has not reached the age of 2 years. The technic of procedure in an infant requires only the complete removal of the sac, and no repair of the inguinal canal is necessary. There is little, if any, likelihood of recurrence if this simple technic is carried out.

This procedure has been tried much more often than the injection method of treatment.

NAUSEA FROM EPHEDRINE

To the Editor:—What is the best way of combating the complication of nausea induced by the use of compounds of ephedrine in the treatment of bronchial asthma?

Howard B. Brown, M.D., Springfield, Mass.

ANSWER.—The nausea which occasionally accompanies the use of ephedrine compounds in full therapeutic doses is due to its local irritant action on the gastric mucosa. This occurs in only a relatively small number of persons. It has been stated that asthmatic patients seem to be more susceptible to the local irritant action of ephedrine compounds.

The sulfate may be less irritant than the hydrochloride and should be used when there is any question of local irritability.

An enteric coating may be tried to obviate the gastric irritability. In some cases the use of small amounts of barbital or its derivatives or, still better, of brometone has given relief. The brometone may be given with the ephedrine. And finally the use of a solution of sodium bromide in rather small doses has been of benefit in cases such as described.

ANTIANEMIC POTENCY OF LIVER

To the Editor: Referring to the inquiry concerning the comparative antianemic potency of calf's liver and lamb's liver (*The Journal*, August 5, p. 530) I wish to advise that I have prepared and tested liver extract prepared separately from beef liver, pork liver, lamb liver and salmon liver. I was unable to detect any great difference in the antianemic potency of the extracts prepared from the three mammals. I had considerable difficulty in extracting the fish liver and can only state that the extract as finally obtained was much less active, in the neighborhood of 50 per cent.

Guy W. Clark, Ph.D., Pearl River, N. Y.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, November 11, page 1833.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, Feb. 12-14. Part III. Chicago, Jan. 16-18. New York, January 15-17. Registration closes Dec. 9. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th Street, Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Written.* Part I. Various places throughout the United States and Canada, March 28. *Oral.* Part II. New York, June 10-11. Applications must be received 60 days prior to examination. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *General oral and pathologic examinations (Part II) for all candidates (Groups A and B)* will be conducted in Atlantic City, N. J., June 8-11. *Applications for admission to Group A, Part II examinations must be on file not later than March 15.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various cities of the United States and Canada, March 2. (The only written examination in 1940.) Oral. New York, June 8-10. *Formal applications must be received before Jan. 1.* Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 3-5. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: Memphis, Nov. 22-23. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: New York, April 30 and May 1. Kansas City, Mo., preceding the Region III meeting of the American Academy of Pediatrics, Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, December 18-19. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlanta, Ga., Dec. 9-11. Sec., Dr. Byrl R. Kirklin, 102-110 Second Avenue S.W., Rochester, Minn.

Illinois June Report

Mr. Lucien A. File, acting superintendent, Illinois Department of Registration and Education, reports the written examination (graduates of foreign schools given also a practical test) held at Chicago, June 20-22. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Three hundred and twenty-seven candidates were examined, 319 of whom passed and eight failed. Twenty-nine physicians were licensed by reciprocity and three physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1939)	80
Chicago Medical School		(1939)	75, 76, 78, 78, 79, 79, 79, 80, 80, 80, 80, 80, 80, 82, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 85, 88
Loyola University School of Medicine		(1938) (1939)	84,* 75,* 77, 78, 79, 79, 80, 80, 80, 80, 80, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 81, 82, 82, 82, 82, 82, 82, 82, 82, 82, 83,* 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 85, 85, 86, 87, 87, 88
Northwestern University Medical School		(1938)	83,* 85, (1939) 78, 79, 80, 80, 81, 81, 81, 82, 82, 82, 82, 82, 82, 83,* 83, 83, 83, 83, 84,* 84, 84, 84, 84, 84, 85,* 85, 85, 86, 86, 87
Rush Medical College		(1937)	80, 83,* 86, 87,* (1938) 79,* 80, 81, 82, 82, 83, 83, 83, 83, 83, 84, 84, 84, 84, 85, 85, 85, 86
The School of Medicine of the Division of Biological Sciences		(1937)	80, (1938) 81, 83, 85, 86
University of Illinois College of Medicine		(1938)	88,* (1939) 78, 79, 79, 80,* 80, 80, 80, 80, 80, 81, 81, 81, 81, 81, 81, 81, 81, 81, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 83, 84,* 84,* 84,* 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 84, 85,* 85, 85, 85, 85, 85, 85, 85, 85, 85, 85, 85, 85, 85, 85, 86,* 86,* 86,* 86, 86, 86, 86, 86, 86, 86, 87, 87, 87, 87, 87, 87, 88,* 88,* 88
Harvard Medical School		(1937) 85, (1938)	82
Tufts College Medical School		(1938)	82
St. Louis University School of Medicine		(1938)	80, 80
University and Bellevue Hospital Medical College		(1934)	84
University of Rochester School of Medicine		(1936)	85*
Ohio State University College of Medicine		(1938)	83
Vanderbilt University School of Medicine		(1937) 77,* (1938)	82
Marquette University School of Medicine		(1939)	79, 80, 82, 85
University of Wisconsin Medical School		(1938)	83
University of Toronto Faculty of Medicine		(1937) (1938)	81,* 82, 83, 84, 86*
Medizinische Fakultät der Universität Wien		(1912) (1919)	81, 78, (1922) 82, (1924) 77, (1925) 75, (1926) 80 (1928) 80, (1936) 79
Deutsche Universität Medizinische Fakultät, Prag		(1932) (1935)	79, 75
Univerzita Komenského Fakulta Lekárska, Bratislava		(1934)	77
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg		(1922)	77
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1917) 75, (1936)	81
Vereinigten Friedrich-Universität Medizinische Fakultät, Halle-Wittenberg		(1920) 78, (1925)	77
Universität Heidelberg Medizinische Fakultät		(1936)	76
Universität Köln Medizinische Fakultät		(1922)	75
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest		(1928)	81
Regia Università degli Studi di Firenze Facoltà di Medicina e Chirurgia		(1936)	80
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1937)	76
Universität Basel Medizinische Fakultät		(1937)	80
Universität Bern Medizinische Fakultät		(1937)	77, 80
Université de Genève Faculté de Médicine		(1934)	79

School	FAILED	Year Grad.
Jefferson Medical College of Philadelphia		(1900)
Université de Paris Faculté de Médicine		(1937)
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1936)
Schlesische-Friedrich-Wilhelms Universität Medizinische Fakultät, Breslau		(1935)
Universität Heidelberg Medizinische Fakultät		(1922), (1936)
Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia		(1937)
Second Leningrad Medical Institute		(1922)

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Loyola University School of Medicine		(1934), (1938)	Wisconsin
Northwestern University Medical School		(1931)	Kansas
University of Illinois College of Medicine		(1938)	Wisconsin
College of Physicians and Surgeons, Keokuk		(1897)	Iowa
State University of Iowa College of Medicine		(1930), (1937)	Iowa
University of Louisville School of Medicine		(1938)	Kentucky
St. Louis University School of Medicine		(1933), (1934), (1936), (1938, 5)	Missouri
Washington University School of Medicine		(1938)	Missouri
University of Michigan Medical School		(1933)	Michigan
University of Nebraska College of Medicine		(1932)	Nebraska
University of Cincinnati College of Medicine		(1931)	Ohio
Western Reserve University School of Medicine		(1935),* (1936), (1938)	Ohio
University of Oklahoma School of Medicine		(1937)	Kansas
University of Tennessee College of Medicine		(1935)*	Tennessee
Baylor University College of Medicine		(1937)	Louisiana
University of Texas School of Medicine		(1932), (1937)*	Texas
University of Wisconsin Medical School		(1934)	Penna.

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College		(1937),* (1937)	N. B. M. Ex.
Yale University School of Medicine		(1931)	N. B. M. Ex.

* Licenses have not been issued.

Wisconsin Reciprocity Report

Dr. E. C. Murphy, secretary, Wisconsin State Board of Medical Examiners, reports eleven physicians licensed by reciprocity on June 29 and September 14. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1933)	California
Rush Medical College		(1937), (1938)	Illinois
Northwestern University Medical School		(1936)	Illinois
University of Illinois College of Medicine		(1937)	Illinois
State University of Iowa College of Medicine		(1936)	Iowa
University of Minnesota Medical School		(1937) (1938)	Maine Minnesota
St. Louis University School of Medicine		(1937)	Illinois
Temple University School of Medicine		(1932)	Penna.
University of Pennsylvania School of Medicine		(1935)	Arizona

Colorado October Endorsement Report

Dr. Harvey W. Snyder, secretary, Colorado State Board of Medical Examiners, reports eleven physicians licensed by endorsement at the meeting held at Denver, October 3. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1939)	N. B. M. Ex.
Northwestern University Medical School		(1938)	Illinois
Rush Medical College		(1927)	Missouri
University of Kansas School of Medicine		(1926)	Kansas
Tulane University of Louisiana School of Medicine		(1936)	Louisiana
Tufts College Medical School		(1937)	N. B. M. Ex.
University of Michigan Medical School		(1934)	Michigan
University of Nebraska College of Medicine		(1938, 2)	Nebraska
University and Bellevue Hospital Medical College		(1927)	New York
University of Pennsylvania School of Medicine		(1926)	New York

Book Notices

Training for Championship Athletics. By C. Ward Crampton, M.D. Cloth. Price, $2.50. Pp. 303, with 7 illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1939.

As the title suggests, Dr. Crampton's book is designed primarily to attract and interest boys and young men. It should do both. The author is well qualified by long experience as an athlete, teacher of athletes and physician to athletes to write of the making of athletes. He does it brightly and effectively, with real analytic ability. So well is the job done that it should make helpful reading for others than prospective athletes, particularly coaches and physical education teachers. In content the volume presents general material on training for various athletic activities, growth, development and diet, much of it made spicy and interesting by being directly connected with prominent athletes such as Bob Feller and Glenn Cunningham. The styles, habits and training methods of a number of such athletes are discussed in a way to stimulate and intrigue the average boy. The latter part of the book is devoted to more specific and detailed matters of diet and technic for various sports. Included are sprinting, mile running, pitching, batting, basketball and fundamentals of football. There are many helpful illustrations from photographs of great athletes and the type is large enough to be easily readable.

Medicolegal Phases of Occupational Diseases: An Outline of Theory and Practice. By C. O. Sappington, A.B., M.D., Dr.P.H. Cloth. Price, $2.75. Pp. 405, with 7 illustrations. Chicago: Industrial Health Book Company, 1939.

Extension of workmen's compensation to include indemnification for disability arising from occupational disease is of comparatively recent origin. Nevertheless there are sound indications already that this development has come to be a major preoccupation in the field of medical jurisprudence. Even a satisfactory definition of what constitutes an occupational disease is extraordinarily hard to reach. When one adds to that fundamental difficulty the associated problems of etiology, disability rating and adjudication, the whole picture becomes one of fascinating complexity. In the construction of a work on occupational disease compensation, therefore, there is at once the necessity of picking out and emphasizing those principles which have received the imprint of judicial and authoritative interpretation. In these respects the author has succeeded admirably. The subject matter, all closely constructed after the handbook style, is treated under four major headings: industry, insurance, medicine and law. The first section deals largely with lists and classifications of industrial hazards. There are also chapters on detection and control from the engineering standpoint which will be of interest to physicians not entirely aware of the considerable advances being made along these lines. The section on insurance testifies for the most part that successful principles for underwriting this type of risk are by no means settled. Past experience in compensating for industrial injuries, valuable as it has been, will provide only a partial solution to the perplexing problems of disability arising out of occupational disease. The economic and social impacts of this movement, especially the medical contribution and particularly past relationships which have existed between medicine and insurance in the casualty fields, are evidently outside the scope of this book. The chapters devoted to medical considerations concern themselves with classifications of exposures according to cause and part affected. Throughout this discussion the need for thorough study of etiology is constantly underlined. Disability estimation largely follows Kessler's previous work. There are only brief references to medical treatment, which because of its unsatisfactory character should occupy a secondary position to preventive principles. The legal section receives the most extensive consideration. There are tables on incidence collected from the few states that publish data on closed occupational disease claims. The controversial details of blanket versus schedule coverage are presented as well as the merits and disadvantages of court procedure, industrial commission practice and the use of medical advisory boards. An appendix contains digests of workmen's compensation laws affecting occupational diseases and also abstracts of court decisions which will be interesting to physicians who have had contact with legal procedure in sufficient degree to allow for proper appraisal.

Urine: Examination and Clinical Interpretation. By C. E. Dukes, M.Sc., M.D., D.P.H., Pathologist to St. Peter's Hospital for Stone and Other Diseases of the Urinary Organs, London. Cloth. Price, $8. Pp. 403, with 110 illustrations. New York, Toronto & London: Oxford University Press, 1939.

As stated in the foreword, the author has attempted to collect methods of laboratory procedure for investigations on the urine useful in clinical practice. He has devoted much space to the clinical interpretation of these laboratory results. This experience has been gained as a result of ten years' service as clinical pathologist to a hospital majoring in the care of patients with urinary tract diseases. The volume is well printed on good paper, adequately indexed and contains excellent photographs, some of which are presented as colored plates. Many references to original articles are given and the volume should serve as an excellent guide to laboratory workers. Errors in proof reading are nil, although on page 21 hippuric acid is referred to as a conjugated product of benzoic acid and glycerin. However, this compound is described correctly later. The book is stronger in the section devoted to microscopic and bacteriologic technics than to the chemical procedures.

Many essential chemical procedures, at least so regarded in the United States, have been omitted. Some of these omissions might be cited. Better tests for the recognition of bile salts utilizing the Pettenkofer reaction are available than those given. In the determination of the p_H value of urine, no mention is made of the quinhydrone or glass electrode methods, although the quinhydrone method is of quite common use since the apparatus is economical, accurate in the range of urine, and avoids the pitfalls of the colorimetric procedures in a solution such as urine, which may be at times highly colored. It would seem that qualitative tests for the presence of urea in urine are superlative and should not be emphasized. The hypobromite method has been almost entirely replaced in this country by the urease procedure. No mention is made of boric acid as an absorbent for ammonia in the aeration procedure for determining urea, although this absorbent is commonly used and obviates the necessity of one standard solution. Only the Benedict uric acid method is given and no reference is made to the direct procedure. Similarly, the excellent method of Sullivan for recognition of cystine is omitted. This method serves admirably for identifying cystinuria as well as the recognition of cystine calculi.

The chapter devoted to hormone assay is a welcome addition to a modern reference work, but here again there is a lack of procedures which are now recognized as useful clinically. No test is described for the determination of the corpus luteum hormone as it is excreted in the urine as pregnandiol glucuronate. The Oesting chemical method for determining androgen is not given nor is there any mention of the lactogenic hormone.

To workers in other countries it would seem that the metric system of measurement should be followed completely. Body weights would not then be referred to as so many stone, such as is given in the section devoted to vitamin C. Chemical tests for vitamins B_1 and B_2 are not presented even though this determination is at present on a quite quantitative basis. The Koppanyi test for barbiturates in the section on recognition of poisons is not included, although it would seem that this method offers the best quantitative technic for the determination of this group of substances.

There is an extended chapter on urinary calculi with excellent illustrations and undue detail for one who is interested in the laboratory angle solely. Usually the pathologist is interested mainly in the type of calculus that is present in order to give the clinician information on which to base therapeutic procedure. The determination of the type of calculus is a simple accomplishment and can be done following the procedure given by the author. However, acetic acid is usually

the acid of choice in the differential acidification for the recognition of calcium phosphate and calcium oxalate.

Essentially this volume offers much of value to the laboratory technician and to the general practitioner by presenting in a simple manner laboratory urinary technic in a concise form.

Die Tuberkulose als Allgemein-Krankheit. Von Dr. G. Liebermeister, Leiter der Inneren Abteilung des Städtischen Krankenhauses Düren. Nr. 72, Tuberkulose-Bibliothek, Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Dr. Franz Redeker, Oberregierungs- u. Obermedizinalrat, Berlin, und Dr. Karl Diehl, dirigierender Arzt, Sommerfeld. Paper. Price, 12 marks. Pp. 108, with 23 illustrations. Leipzig: Johann Ambrosius Barth, 1939.

This small volume will be of interest to the specialist in tuberculosis but of less concern to the general practitioner and specialist in other diseases, in spite of the fact emphasized by the author, to which exception cannot be taken, that the general manifestations of tuberculosis are such that internists, pediatricians, surgeons and physicians in the specialties should be familiar with them. Liebermeister's book represents a mixture of clear summarizing of accepted facts and an attempt to explain them in a complicated way that will seem unnecessarily confusing to all not versed in the varying terminology built around the phenomenon of allergy. Clinicians with long experience in tuberculosis, in turn, are apt to take frequent exception to the rather glib explanations of variation in the course of tuberculosis in terms of euergy, dysergy and nomergy and to feel that commonly the course does not conform with the diagrams in the text intended to illustrate stages of the disease. Specialists in tuberculosis, however, will find the author's conceptions stimulating in directing attention to the relations of allergy and illness.

Hygiene. By J. R. Currie, M.A., M.D., D.P.H., Henry Mechan Professor of Public Health, University of Glasgow, Glasgow. Cloth. Price, $5. Pp. 324, with 34 illustrations. Baltimore: William Wood & Company, 1938.

This textbook on hygiene is described by the author as intended for the use of students of medicine, priority being given to the social aspect of hygiene. Although Currie states that he does not elaborate the administrative and legal points of hygiene, one third of the book describes rather fully the provisions in Great Britain for medical and public health care, including maternal and child welfare, school hygiene, mental hygiene and industrial hygiene. One chapter is devoted to a discussion of social insurance as it is employed in Great Britain. This discussion is largely an enumeration of the laws which have been passed and the benefits available to individual citizens without any opinions being given with regard to the effectiveness of such legislation. The remainder of the volume takes up various aspects of personal and environmental hygiene, such as food, ventilation, lighting, water supply and waste disposal, and gives a rather detailed treatment of the individual infectious diseases. This book should serve the purpose for which it is written, that is, as a textbook on hygiene for medical students in Great Britain. Because much of the material is concerned with specific legislation and practices in that country, its chief value in the United States will be as a reference book for those wishing to get information on practices in Great Britain.

Les troubles de la thermorégulation (coup de chaleur). Par L. Dérobert. Paper. Price, 60 francs. Pp. 218, with 13 illustrations. Paris: Masson & Cie, 1939.

This work is an experimental study the purpose of which is to determine the pathology of the clinical group of symptoms known as heat stroke. Two thirds of the monograph consists of a survey of the literature that the author considers has a bearing on the subject. Although there are twenty-five pages of bibliography, the American work on the subject is incomplete and most of the authors mentioned in the text cannot be found in it. The author exposed dogs, rabbits and guinea pigs to high humidity and temperatures ranging from 40 to 45 C. (104 to 113 F.), studied the clinical effects and examined them post mortem. The first group of animals died in from thirty-five to seventy-five minutes. The second group also exposed to high humidity and to lower temperatures, 32 to 35 C. (89.6 to 95 F.), survived. The physical and clinical changes were noted and they were later examined pathologically. The final group consisted of a case of heat stroke and one of severe burns in human beings. Descriptions with illustrations of the morphologic changes in the blood cells were given and some measurements of the chemical constituents of the blood recorded. The author concludes that "elevated temperature on one part of the body or on the whole body is capable of causing benign symptoms (syncope and collapse) or serious symptoms (properly known as heat stroke) the cause of which is disintegration of the albumins. . . . Although this disintegration is important, the marked increase of 'albumoses' causes lesions as important as those found in anaphylactic shock. These 'albumoses' can cause the same lesions in an organism previously sensitized even though it is not specific, or in an organism in which the antitoxic barriers are deficient. . . . This produces a disintegration of the first importance in which the polypeptides cause lesions of the vegetative centers, which in their turn are responsible for changes in the organ as a whole." The evidence cited for these conclusions is inconclusive. The relation of the metabolism of water and the electrolytes to shock might have been discussed with advantage.

M One Thousand Autobiographical Sonnets. By Merrill Moore. Cloth. Price, $5. Pp. 1,000. New York: Harcourt, Brace & Company, 1938.

This book is cleverly titled with the metric symbol for a thousand, which happens also to be the author's initials. It contains 1,000 sonnets of 50,000 which he has written, though he pledges himself that most of the rest will not be published. These sonnets are in many different forms. A considerable number present the traditional octet and sextet of the established form for this poetic medium. Others are differently divided, one for example consisting of couplet, triolet couplet and triolet quatrain, with the second line of the latter broken in two. There are others in two stanzas of seven lines, some in three-five-three and three, and still others in five-two-two and one. The rhythm is as causal and irregular as the stanza divisions. Lines are frequently broken in the middle. Rhymes appear or are ignored, at the author's pleasure. The sonnets are said to be autobiographic, but the reader would have difficulty recognizing this fact if his attention were not called to it by the introductory statement. The work does show strongly the influence of his medical training and his interest in psychiatry, since many of his sonnets deal with medical matters, as, for example, "There Was A Man":

> . . . He was born in Wurttemburg,
> Came to America at twenty, never married,
> Never missed operas, and always tarried
> Before antique shop windows and before
> Shops where meerschaum objects and where amber
> Were displayed, and never spoke English well,
> And got along very quietly till he fell
> And broke his hip.
> Pneumonia ended his life
> In Bellevue neatly stretched between two sheets
> By crevasses and canyons that were streets.

Other sonnets deal with the psychology of deafness, "Ambulance Call," and a satire on the gyrations of the bald entitled "Too Late for Herpicide." A whole division is devoted to dreams and symbols and in this is included a tricky "Sonnet in Code" and one composed almost exclusively of Pullman names and other words. There is such endless variety of form and topic in this book that should make it provocative and stimulating reading for one who can pick it up and read it by snatches. In fact, the reviewer is not inclined to hold the author to his promise of nonpublication of the rest of his work, or at least a portion of it.

Short Stature and Height Increase. By C. J. Gerling. Cloth. Price, $3. Pp. 159, with illustrations. New York: Harvest House, 1939.

The title is intriguing but may lead the man of short stature, to whom this book is addressed, to expect far more than the author can deliver. The author does not promise in the various chapters to increase the height of the individual but points out the various factors that may produce an illusion of increased height. The book is interestingly and simply written and presents the various factors responsible for growth. Inheritance, the mechanism of growth and all the factors as glands, food, sleep, age and disease are discussed in their relationship to growth. The author then tells of the folly of using highly advertised self-prescribed drugs and devices to bring about an

increase in height, There is a brief but excellent discussion of the little faith that should be placed on weight tables based on age and height. The main thesis of the book is that posture is the best and surest aid for those of short stature. It can bring about an actual increase in height only so far as the person has allowed himself to assume a slouch. The benefits of exercise to increase the tone of the muscles responsible for good posture may result in better health and a better appearance and with it a better outlook on life. The chapter on stature aids is of interest in that it discusses shoes and clothing and the part they play in producing illusions of greater height. It is a book that the practicing physician may want to recommend to his patients whose short statures are keeping them from a normal, cheerful outlook on life.

Life and Letters of Dr. William Beaumont. By Jesse S. Myer, A.B., M.D. With an introduction by Sir William Osler, Bt., M.D., F.R.S. Second edition. Cloth. Price, $5. Pp. 327, with illustrations. St. Louis: C. V. Mosby Company, 1939.

Here is a new printing of the famous book by Myer first published in 1912. It still bears the introduction which Dr. William Osler wrote at that time. The name of Beaumont is almost supreme among workers in the field of physiology in this country as our greatest pioneer. At the meeting of the International Congress of Physiologists in Boston in 1929, William Beaumont was figuratively canonized as the Patron Saint of American Physiology. In a new introduction by Dr. A. C. Ivy there is an analysis of present day points of view in relationship to Beaumont's experiments. The present volume contains a reproduction of the fine painting made by Dean Cornwell in 1938 and is otherwise similar to the edition published in 1912. This book is a "must" item for every American physician interested in medical history.

Otolaryngology in General Practice. By Lyman G. Richards, M.D., Associate Professor of Otolaryngology, Tufts Medical School, Boston. With a foreword by D. Harold Walker, M.D., Consultant in Otology, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts. Cloth. Price, $6. Pp. 352, with 72 illustrations. New York: Macmillan Company, 1939.

This textbook on otolaryngology for use by the general practitioner accomplishes its purpose in an admirable way. The author discusses the most common diseases and complaints which the general practitioner is called on to take care of in everyday practice. The impression one gets on reading the book is that here are the opinions of a person of experience, unmarked by strong personal bias and characterized by a great deal of good common sense. The author has not described in great detail operations which the general practitioner has no right to do and which he is not called on to do. The one operation on which time is spent is that of tonsillectomy and adenoidectomy, and this is eminently proper because, regardless of contrary opinion, most of the tonsillectomies in this country are being done by nonspecialists. The general practitioner interested in diseases of the ear, nose and throat can gain much by a careful reading of the text.

Headache and Head Pains: A Ready Reference Manual for Physicians. By Walton Forest Dutton, M.D., Director, Medical Research Laboratories, Amarillo, Texas. Cloth. Price, $4.50. Pp. 301, with 6 illustrations. Philadelphia: F. A. Davis Company, 1939.

Headache is a symptom which may occur with almost any disease affecting the human body. To attempt to give a differential diagnosis of headache with treatment would involve a complete knowledge of all phases of medicine. One volume, as one can readily see, would be quite inadequate. The introduction deals with the neurophysiology, etiology, analysis of causal factors and discussion, including history and method, for relief of pain. This part in itself, although superficial, is fairly well written. Opium is mentioned as the most important analgesic, a statement with which the reviewer would not agree. The rest of the book deals with diseases causing headache and their treatment. This is arranged alphabetically instead of in order of their importance. Such a common condition as sinus disease is given two pages and so is the rare condition actinomycosis. Brain tumor is said to be a common disease, which is an erroneous statement; opium derivatives are prescribed, which are actually contraindicated in most craniocerebral diseases and injuries. Functional disturbances are erroneously handled only with drugs. Although the book has a few good prescriptions, the reviewer can see no value for even the layman and certainly not for the practitioner or specialist.

Index-Catalogue of the Library of the Surgeon General's Office, United States Army (Army Medical Library). Authors and Subjects. Fourth Series. Vol. IV: Daae-Dzionara. [Including] Specimen Pages from a Bio-Bibliography of XVI. Century Medical Authors [and a] First Addition to the Reference List of Congresses. Cloth. Price, $2. Pp. 756. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

The fourth volume of the fourth series of the Index Catalogue of the Surgeon-General's Office covers the letter D. The Surgeon-General's Library now contains approximately 409,223 volumes, 377 pamphlets and almost 200,000 theses. About 18,000 new items are added to the library each year. Recently the subscriptions of the library have been extended by some 200 new medical journals, of which approximately 50 per cent are South American and 15 per cent from soviet Russia. This work has long been known as a competent index to the material that it covers. In the current issue the headings dementia, dentistry, digestive tract, disability and drugs as well as dermatitis, diabetes, diarrhea and diet indicate the importance of the letter D in any medical classification.

Pratsi y materiali pershogo Kharkivskogo Derzhavnogo Medichnogo Institutu. Vidpovidalniy redaktor: A Gasparyan. Vipusk X: Organogumoralna regulyatsiya i aktivni metodi likuvannya. Chastina 1: Giperatsidni gastriti. [Works and Materials of First State Medical Institute of Kharkov. Volume X: Organohumoral Regulation and Active Methods of Treatment. Part 1: Hyperacid Gastritis.] Cloth. Price, 5 krb. Pp. 128, with illustrations. Kiev: Derzhavne medichne vidavnitstvo, 1938.

This small volume of papers from the department of internal medicine headed by Prof. A. P. Korkhov of Kiev deals with acid gastritis. Korkhov develops the thesis that a number of diseases of the liver, stomach, duodenum and biliary tracts have for their basis a shift to acidosis in the blood and tissues. He therefore advocates in the treatment of acid gastritis and gastric ulceration, besides the rest and the diet, alkalization of the organism by administration of sodium bicarbonate and magnesium carbonate in the proportion of 4:1 based on consideration of the determined physicochemical indexes of the urine, the blood and the gastric juice. The text is in Ukrainian, with a summary in Russian and in French.

A Survey of Child Psychiatry Contributed by Contemporary British Authorities. Edited on behalf of the Child Guidance Council by R. G. Gordon, M.D., D.Sc., F.R.C.P., Medical Director Child Guidance Council. Cloth. Price, $3.50. Pp. 278. New York & London: Oxford University Press, 1939.

Here a number of prominent British writers discuss child psychiatry under the special headings of physical illness, mental illness, sociologic aspects and special syndromes. The latter concern chiefly enuresis, stammering, sleep disorders, tics and sexual difficulties. A book of this type indicates how far we have advanced in our study of the child since the leaders of medical and social science began to give these problems special attention. It is interesting to know that the Commonwealth Fund of America aided in setting up a demonstration clinic in London and was really responsible for introducing the whole field of child guidance into Great Britain. The competent articles here presented are an indication of the great advancement that has been made.

Evaluation of the Industrial Hygiene Problems of Illinois. Prepared by Division of Industrial Hygiene. State of Illinois, Department of Public Health, A. C. Baxter, M.D., Director. Paper. Pp. 258. Chicago, Illinois, 1939.

A series of industrial hygiene surveys have been conducted by divisions of industrial hygiene in state health departments operating under plans and instructions originally devised by the United States Public Health Service. As a result the publications of the individual bureaus of industrial hygiene take on aspects of uniformity which, in the event of subsequent compilations on a countrywide basis, will provide data of inestimable value. Even if such were not the case, a review of the industrial hygiene problem in Illinois because of the variety of its manufacturing processes takes on aspects of

importance which transcend mere local interest. In this instance the great number of tables which list the major exposures of all the principal occupations occurring in the state and the percentage of workers exposed to specified materials in those occupations make it in many respects the most useful of the state reports yet published. The compilers of this report consider it merely a statistical presentation. It is likely that a future publication will present an industrial hygiene program for the state based on this preliminary fact finding investigation.

The International Medical Annual: A Year Book of Treatment and Practitioner's Index. Edited by H. Letheby Tidy, M.A., M.D., F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc. Fifty-Seventh Year, 1939. Cloth. Price, $6. Pp. 602, with 196 illustrations. Baltimore: William Wood & Company, 1939.

This volume is now in its fifty-seventh year. A considerable number of British physicians cooperate in producing the book, which resembles the American Year Book series except for the fact that here everything is in one volume. There is an extensive index and the book is beautifully illustrated. Each of the articles concerned is supplemented with a suitable bibliography. Practically all the articles concern papers published during 1937 and 1938.

Gastrointestinal Dysfunction. By Barton Arthur Rhinehart, A.B., M.D., Associate Professor of Roentgenology, University of Arkansas School of Medicine, Little Rock. Cloth. Price, $6. Pp. 311, with 48 plates. Little Rock, Arkansas: Central Printing Company, 1939.

This is a comprehensive title, but the student or physician who hopes to discover in this volume a comprehensive treatise dealing in detail with the many and varied types of functional disorders of the digestive tract will meet with disappointment. It is not a textbook. The author states on the flyleaf: "This book is dedicated to the proposition that nutritional deficiencies cause the majority of the gastrointestinal disorders of civilization" and he attempts to promulgate this highly debatable theory by assembling a great and extremely heterogeneous mass of material quoted from the writings of clinicians, investigators in the field of metabolism and others. The author is himself a roentgenologist. It is unfortunate that the equipment he was able to bring to his task did not include a requisite fundamental knowledge of disorders of the gastrointestinal tract.

Richtlinien praktischer Orthopädie. Von Dr. Albert Lorenz. Paper. Price, 15 marks. Pp. 464, with 123 illustrations. Vienna: Franz Deuticke, 1939.

The author, who apologizes for the similarity of his name to that of the father of German orthopedics, Adolf Lorenz, proposes his book for the use of specialists. He attempts to present only material which he considers of proved value; etiology and unusual symptomatology are handled more briefly than therapy and surgery; scientific experiments are given secondary consideration to practical experience and the general trend is conservative. The subject matter covers the complete category of practical orthopedic problems and their treatment. The fracture problem is confined to a discussion of fractures of the neck of the femur. This volume serves as a good compilation of current ideas in orthopedics. The author quotes freely from the American literature throughout the book, a large portion of which was written in New York. Although the material presents little originality, the discussions are adequate.

Arthritis in Women: A Clinical Survey with Notes and Statistics from Representatives of Committees on Rheumatism in Various Countries, and a Statement on the "Campaign Against Rheumatism, Retrospect and Outlook" (1935). Also a Suggestion for Setting up Rest Houses for Rheumatoid Arthritis. By R. Fortescue Fox, M.D., F.R.C.P., F.R.Met. Soc., President of the International League against Rheumatism. Founded on a Lecture Delivered at the Institute of Hygiene, London, April, 1936. Paper. Price, 2s. 6d. Pp. 35. London: H. K. Lewis & Co., Ltd., 1936.

The clinical course of arthritis in women is described. The material presented is accurate and well developed, but one would expect a great deal more from the title of the pamphlet. The pathology of arthritis is barely mentioned. The ideas of rest homes and spa treatments are not new but deserve emphasis at this time.

Trudy Stalingradskogo Gosudarstvennogo Meditsinskogo Instituta. Tom I. Pod redaktsiey A. I. Bernshteyna, S. N. Kasatkina i A. Ya. Pytelya. [Works of Stalingrad Medical Institute. Volume I.] Cloth. Pp. 159, with illustrations. Stalingrad: Oblastnoe knigoizdatelstvo, 1939.

The volume consists of a monograph on the development of sesamoid bones in man and a medley of unrelated subjects. It presents little of interest to physicians and does not lend itself to review.

The Story of a Baby. By Marie Hall Ets. Cloth. Price, $2.50. Pp. 63, with illustrations by the author. New York: Viking Press, 1939.

At the Century of Progress Exposition in Chicago in 1933 and 1934 one of the items of greatest interest was the exhibit of human embryos. In this beautiful book the author has redrawn the embryo and supplies a text printed in large type. She describes succinctly and beautifully the development of the baby. Many a parent will find a book of this type exceedingly useful in telling the story of childbirth to children of various ages.

English-German and German-English Medical Dictionary. Part I: English-German. Englisch-Deutsches medizinisches Wörterbuch. By Adalbert Springer. Fifth edition. Cloth. Price, 6 marks. Pp. 201. Vienna: Franz Deuticke, 1939.

This little medical dictionary is useful as far as it goes but omits a considerable number of words which might frequently need to be consulted, such as calibration, arrhythmia, fibrosis, ambulatory and sedation. The book is indicative of the relative ineffectiveness of any kind of dictionary which is not truly inclusive.

The Genuine Works of Hippocrates. Translated from the Greek by Francis Adams, LL.D. With an Introduction by Emerson Crosby Kelly, M.D. Cloth. Price, $3. Pp. 384. Baltimore: Williams & Wilkins Company, 1939.

This translation of Hippocrates has been reprinted many, many times, and there continues to be a demand for it. The present edition is put out in good paper, with a suitable binding, and has an index.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Silicosis: Death of Employee Attributed to Failure of Employer to Provide Safe Place of Work.—The plaintiff sued the defendant corporation to recover damages for the death of her husband. She alleged that he died from silicosis, contracted as a result of the failure of the defendant to provide him with a reasonably safe place in which to work. The trial court gave judgment for the plaintiff and the defendant appealed to the Supreme Court of Pennsylvania.

The plaintiff's husband was employed from 1924 to 1935 as an operator of a segment grinder, used for polishing ceramic or pottery products manufactured by the defendant. In October 1935 he was admitted to a state sanatorium for the treatment of tuberculosis and remained there until he died, Feb. 9, 1936. The plaintiff contended that the defendant failed to provide the grinder with an adequate hood and a sufficient device, such as a suction fan and pipe, for carrying away the dust. She charged that excessive quantities of dust containing free silica were released into the atmosphere about the machine and that as a result of inhaling this silica-laden air over a period of years her husband contracted silicosis, which brought about the tuberculous condition causing his death. The defendant was negligent, she further contended, because it failed to supply the employee with a dust mask of the character customarily worn by operators of such grinding machines. According to the plaintiff, the dust hazard arose because the defendant violated the provisions of a Pennsylvania act passed in 1905 requiring that "The owner or person in charge of an establishment where machinery is used shall provide . . . exhaust fans of sufficient power, or other sufficient devices . . . for the purpose of carrying off poisonous fumes and gases, and

dust from emery-wheels, grind-stones and other machinery creating dust." The plaintiff's evidence went to show that, although an exhaust fan was installed at the machine which her husband operated, it was not of sufficient power to carry off the dust produced; that the mechanism of the fan was not kept in working condition, and that the defendant failed to warn the employee of the dangers to which he was subjected in breathing the dust.

The defendant denied that the plaintiff's husband died of silicosis, claiming that the cause of his death was pulmonary tuberculosis contracted from causes having no relation to the conditions of his employment. It claimed that there was not a sufficient amount of free silica in the atmosphere about the grinder to cause silicosis. It further contended that it complied with the provisions of the Act of 1905 by attaching to the machine a dust-removal appliance of the best type available and in general use throughout the industry, that it provided the employee with a mask for his use but that he neglected to use it and, finally, that the employee was guilty of contributory negligence.

The disease to which the plaintiff attributed her husband's death, said the Supreme Court, was occupational and therefore was not compensable at the time under the workmen's compensation act of Pennsylvania. The real question before the court, therefore, was whether the defendant furnished the deceased a reasonably safe place to work as measured by the requirements of the Act of 1905. The provisions of that act are mandatory, the court pointed out, and proof that the employer has failed to comply with the duties imposed thereby and that an employee, without negligence on his part, has been injured as a result of such failure constitutes negligence, rendering the employer liable for the harm so caused. While the plaintiff admitted that there was a cover over the wheel and that a suction fan was installed by the defendant, it was denied that they were sufficient to eliminate the accumulation of dust in the atmosphere. It was not disputed by the defendant that the fan and cover were inadequate to carry away the dust about the grinding machine. The defendant urged, however, that it was not an insurer of the employee working at a dangerous piece of machinery and that it performed its full duty under the statute when the preventive devices which it adopted were of the kind generally approved and in use in like plants throughout the country. But, said the court, merely because the particular device employed was similar to that "generally approved and customarily used" in the industry of itself would not exonerate the defendant of the charge of negligence. While the custom or practice prevailing in a particular business in the use of methods, machinery and appliances is a most important factor in determining the question of negligence, ultimately it is for the jury to ascertain whether under all the circumstances the defendant was negligent. And certainly ordinary usage in disregard of a statutory duty cannot relieve the defendant of liability for a failure to respond to the legislative mandate. Whether or not the defendant in the present case was negligent presented a question for the jury to decide, and its finding for the plaintiff, the court said, compels the conclusion that the device used by the defendant was insufficient. An ineffective and feeble device is no more a fulfilment of the legislative demand than no device at all. The shadow of compliance will not be accepted for the substance of the statutory requirement.

There was some conflict in the evidence as to whether the death of the employee was caused by silicosis or by pulmonary tuberculosis. He inhaled a vast quantity of the dust particles in consequence of his constant exposure to them. The testimony was at variance on the question whether the atmosphere contained free silica in sufficient quantities to cause silicosis. The plaintiff produced evidence to the effect that silicosis could result from the constant inhalation of dust particles containing even a minute quantity of free silica. Experts testified that an autopsy disclosed the presence of "gritty" substance, scar tissue and "nodules" in the decedent's lungs, indicating that he suffered from silicosis. Other "nodules" were found pointing to a tuberculous as well as a combined tuberculous and silicotic condition. In the light of such testimony, the court said, it cannot be said that the jury's determination of this question is not supported by the record.

Ordinarily available in master-servant cases, the defense of assumption of risk is not permissible where the employee is injured through the failure of the employer to comply with a legislative requirement such as contained in the Act of Pennsylvania of 1905. Although the employee in the present case may have been aware of the presence of the dust in the factory, it is, the court said, extremely doubtful that he was conscious of the real risk involved, the danger of the contraction of silicosis. Such a degree of scientific knowledge is not to be attributed to an ordinary factory employee. The defendant contended that the employee was negligent in failing to use the dust mask with which he was provided. The plaintiff's witnesses testified, however, that no workable masks were supplied, since those furnished were unfit for use. Here again the question of contributory negligence was one for the jury to decide, and the Supreme Court could find no reason to disturb the finding of the jury with respect to this matter.

After a thorough review of the record, the Supreme Court of Pennsylvania affirmed the judgment of the trial court for the plaintiff.—*Price v. New Castle Refractories Co. (Pa.), 3 A. (2d) 418.*

Optometry: Cooperative Arrangement Between Optical Company and Physicians as Practice of Optometry.—In this suit, the State of Iowa on relation of the Commissioner of Health sought to enjoin the defendants from practicing optometry without a license. The trial court issued the injunction and the defendants appealed to the Supreme Court of Iowa.

The state undertook to sustain the injunction on the ground that the arrangement entered into between the defendants and the physicians constituted an employment agreement and that the employment of one legally authorized to practice optometry in the state of Iowa by an unlicensed person or corporation is prohibited by statute. The business of the defendants consisted of selling eyeglasses or spectacles by filling prescriptions prescribed by authorized persons and selling optical merchandise. They were opticians. Their practice was to rent an office consisting of one or more rooms adjacent to the rooms in which they carried on their business and to arrange with a licensed physician to occupy such rooms and practice optometry. The defendants paid the rent, light, heat and telephone bills and furnished all the equipment used by the physician in examining and testing eyes. The examination fees charged by the physician, which ranged from $1 to $2, belonged to him. None of the earnings of the physician belonged to or was paid to the defendants. The defendants, however, guaranteed the physician that his earnings would be $40 a week. If the earnings were under that sum they would pay him the difference. While there was some testimony to the effect that the physician was not obligated to send patients to whom prescriptions had been given to the defendants, the court was convinced that the real arrangement was that the defendants would send all persons who came to their establishment without a prescription, and who desired glasses, to the physician and that the physician was to direct his patient to the defendants for the purpose of having his prescription filled.

In the opinion of the court, the state failed to establish its contention that the relationship of employer and employee existed between the defendants and the physicians. No witness testified that the defendants under the arrangement had the right to control or influence a physician in making the examination, and the test of the employer-employee relation, the court continued, is the right of the employer to exercise control of the details and method of performing the work. After reviewing the facts in this case, the court was convinced that the defendants did not have that right under the arrangement it had with physicians. The physicians, all of whom had practiced prior to the arrangement, were not performing the business of the defendants but were carrying on their own business of optometry under a reciprocal arrangement with the defendants for the mutual financial benefit of both parties. When a patient came to consult one of these physicians there was the personal relationship of patient and physician between them. The physicians, in making the refraction, represented the patient and not the defendants. The record showed that the business of the defendants was materially increased by the

arrangement. The court was satisfied after a careful reading of the record that the defendants did not coerce or influence the physicians relative to prescriptions. The profession of the physicians and the business of the defendants were separate and each operated independently of the other.

The defendants urged that the employment of one legally authorized to practice optometry in Iowa is not forbidden by statute, and even if the arrangement did constitute an employment contract it did not constitute the practice of optometry by the defendants in violation of the laws of the state. With this contention, however, the Supreme Court disagreed and in doing so reaffirmed the interpretation placed on Iowa laws and the principles announced in two previous cases, *State* v. *Kindy Optical Company*, 216 Iowa 1157, 248 N. W. 332, and *State* v. *Bailey Dental Company*, 211 Iowa 781, 234 N. W. 260.

The decree of the trial court enjoining the defendants from practicing optometry was therefore reversed and the case remanded.—*State ex rel. Bierring, Commissioner of Public Health, v. Ritholz et al. (Iowa), 283 N. W. 268.*

Workmen's Compensation Acts: Compensability of Hernia.—The employee filed a claim for compensation under the workmen's compensation act of South Carolina, alleging that he had suffered a compensable hernia during the course of his employment with the defendant company. The industrial commission disallowed the claim, which action was affirmed by the common pleas circuit court of Spartanburg County. The employee then appealed to the Supreme Court of South Carolina.

The workmen's compensation act of South Carolina provides that in all claims for hernia alleged to have resulted from accidental injury sustained in the course of employment it must be definitely proved that there was an injury resulting in hernia; that the hernia appeared suddenly; that the hernia or rupture immediately followed the accident; that it did not exist prior to the accident for which compensation is claimed, and that it was accompanied by pain. The employee had been in the employ of the defendant company as a dispenser in one of its dye rooms continuously from February 1937 until July 14, 1937, the date he claimed to have suffered his injury. The employee's duties included bringing drums of hydrosol, weighing between 500 and 600 pounds, from a storeroom upstairs, inserting a spigot in the head of the drum and placing the drum on a low wooden rack. On the date of the accident, the employee, assisted by a fellow employee, was engaged in lifting a full drum of hydrosol on to the wooden rack when the spigot in the head of the drum became entangled with the framework of the rack and the drum slipped, jerking the employee and throwing a heavy strain on him for two or three minutes. With the assistance of a third employee, the drum was finally, after about ten minutes, placed in position. The employee continued working at lighter tasks for the remainder of that day. He stated that he was not conscious of any pain during the struggle with the metal drum, but after the lifting was over he said he "felt a tired and let down sensation." The next morning, July 15, when he got out of bed, he experienced a sharp pain, which continued that day and the following day, both of which days, however, he continued to work at light tasks. On July 17 he consulted a physician who diagnosed his trouble as inguinal hernia. On the succeeding morning he consulted the company physician, who made the same diagnosis and instructed him to quit work, which he did. The employee testified that he had no hernia or evidence of hernia previous to this accidental injury.

The employee had been operated on in the hernial region at the age of 7 years for an undescended testicle and was discharged as cured. The surgeon who performed this operation testified that there was no indication of hernia at that time. The company physician testified that the incision in the abdominal wall for the operation in question was at approximately the same place as for a hernia and that he found a scar in that region on the employee. He said with reference to that operation that it might or might not have caused a weakness of the tissues in that area and that a conclusion on that point could not be definitely stated. He testified, too, that the employee's hernia might have existed for several years but that there was no way to determine from an examination when it had its inception or when the rupture occurred.

The industrial commission found that the hernia was congenital in origin and that it was caused by a preexisting weakness of the tissue. The Supreme Court, however, could find no evidence in the record to warrant that finding or a finding that the employee suffered from a hernia at any time prior to the accident. The commission found, too, that the employee felt no pain at the time of the accident, and the court thought that there was ample testimony in the record to support this finding. The employee repeatedly disclaimed that he felt pain at the time of the accident. He argued, however, that the language of the compensation act "that it was accompanied by pain," did not mean that pain must be coincident with the accidental injury, but that the appearance of the hernia must be accompanied by pain. As the court construed the act, however, the injury and the pain must be referable to a definite time, place and circumstance, and the pain must accompany the accidental injury. The court did not feel warranted in ascribing to the words "tired" and "exhausted" the common sense of the word "pain." Nontechnical definitions of "pain," said the court, while varying in form of expression, all connote some degree of present distress or suffering, contradistinguished from normal fatigue.

The court further thought that the words "suddenly" and "immediately" as used in the act in relation to hernia were elastic terms, admitting of much variety of definition. The court did not think that these words should be construed as the equivalent of the word instantaneous. Like other similar absolute expressions, they were used in the act with less strictness than the literal meaning requires. To give them their literal signification in all cases, regardless of the attendant situations and circumstances, would, the court said, often defeat meritorious claims on purely technical grounds.

Because, however, the employee felt no pain at the time of the accidental injury, the Supreme Court affirmed the judgment of the lower court disallowing the employee's claim for compensation.—*Rudd v. Fairforest Finishing Co. (S. C.), 200 S. E. 727.*

Medical Services: Liability of County for Emergency Medical Services Rendered Indigents—A physician, said the Supreme Court of Nebraska, not employed by a county may not recover from the county for services rendered to a poor person in an emergency when a county physician has been duly appointed to care for the poor, the latter physician being able, willing and ready to serve but not consulted. The ignorance of the attending physician of the fact that the county had regularly employed a county physician, and thus provided for the exclusive medical treatment of the poor, will avail him nothing.—*Miller v. Banner County (Neb.), 283 N. W. 206.*

Society Proceedings

COMING MEETINGS

American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 28-30. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.

American Society of Anesthetists, Los Angeles, Dec. 14. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.

American Society of Tropical Medicine, Memphis, Tenn., Nov. 21-24. Dr. E. Harold Hinman, Wilson Dam, Ala., Secretary.

Eastern Section, American Laryngological, Rhinological and Otological Society, Pittsburgh, Jan. 5. Dr. John R. Simpson, Medical Arts Bldg., Pittsburgh, Chairman.

Radiological Society of North America, Atlanta, Ga., Dec. 11-15. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Society for the Study of Asthma and Allied Conditions, Philadelphia, Dec. 9. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.

Society of American Bacteriologists, New Haven, Conn., Dec. 28-30. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

Southern Medical Association, Memphis, Tenn., Nov. 21-24. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southern Section, American Laryngological, Rhinological and Otological Society, Columbia, S. C., Jan. 8-9. Dr. Walter J. Bristow, Doctors Bldg., Columbia, S. C., Chairman.

Southern Surgical Association, Augusta, Ga., Dec. 5-7. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Western Surgical Association, Los Angeles, Dec. 15-16. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

58: 691-930 (Oct.) 1939

*Active Immunization Against Pertussis: Final Report on Cleveland Immunizations of 1934-1935. J. A. Doull, G. S. Shibley, Grace E. Haskin, Huldah Bancroft, J. E. McClelland and Helena Hoelscher, Cleveland.—p. 691.

Experimental Asthma. B. Ratner, New York.—p. 699.

Studies in Immunity: VI. Spontaneous Changes in Dick and Schick Reactions of Children. R. A. Lyon and A. G. Mitchell, Cincinnati.—p. 734.

Factors Influencing Development of Sexual Attitudes and Sexual Awareness in Children. J. H. Conn, Baltimore.—p. 738.

Response to Antiserums in Meningococcic Infections of Human Beings and Mice: Comparative Study. Hattie E. Alexander, New York.—p. 746.

Effect of Irradiated Milks on Storage of Nitrogen and Acid-Base Minerals in Children. Frances Cope Hummel, Helen A. Hunscher and Icie G. Macy; with assistance of Mary Bates, Priscilla Bonner, J. Horton, Marion Shepherd, Helen Souders, Louise Emerson and A. Theresa Johnston, Detroit.—p. 753.

Asthma in Children Treated with Autogenous (Bronchoscopic) Vaccine. Jean Crump, Philadelphia.—p. 768.

*Basal Metabolism of Tuberculous Children: III. Tuberculosis of Bone. Anne Topper, New York.—p. 778.

Familial Cleidocranial Dysostosis (Cleidal Dysostosis): Preosseous and Dentinal Dystrophy. W. E. Anspach and R. C. Huepel, Chicago.—p. 786.

Sequence of Roentgen Evidence of Tuberculosis and Cutaneous Sensitivity to Tuberculin: Study of Infants. M. I. Levine, New York.—p. 799.

*Iron Deficiency Anemia in Children. O. D. Abbott and C. F. Ahmann, Gainesville, Fla.—p. 811.

Acute Suppurative Thyroiditis During Childhood. J. Greenfield and G. M. Curtis, Columbus, Ohio.—p. 837.

Active Immunization Against Pertussis.—Between May 27, 1934, and July 30, 1935, Doull and his colleagues gave pertussis vaccine to 483 Cleveland children from 6 to 15 months of age. The vaccine was prepared from strains of Haemophilus pertussis recently isolated and proved to be in phase I of Leslie and Gardner. The children were selected from the active registers of five child welfare stations of the Cleveland Division of Health. As a control group 496 children comparable in age and other pertinent characteristics were selected from the same sources. Four inoculated children who contracted pertussis early in the study evidently received the first dose of vaccine while in the initial stages of the disease. These children were omitted from further study. For the whole period of 172 weeks of observation the number of cases of pertussis reported was seventy-four in the inoculated group and ninety-four in the control group. Although incidence somewhat favors the inoculated, the difference is not impressive. Seventy-five of the inoculated and sixty-two of the control group were exposed to pertussis by its being introduced into the family by an older child. In two of the former cases it was ascertained that the disease was probably present in the home at the time of the first inoculation. If these children are regarded as not inoculated at the time of exposure, there are seventy-three instances in which inoculated children were subjected to household exposure. Fifty-six, or 77 per cent, of the children were attacked. In the control group the sixty-two exposures resulted in sixty-one attacks. From these figures the most that can be concluded is that under conditions of household exposure the vaccine may have protected 23 per cent of the inoculated children from attack. In an endeavor to classify the cases according to severity the records of the cases have been studied by different persons, but every tabulation has demonstrated a higher proportion of mild attacks in the inoculated than in the control group. On the average, higher leukocyte counts were found for patients of the control than for those of the inoculated group. This fact may be interpreted as indicating more severe systemic reactions in the former. However, no significant differences were observed in the lymphocyte counts.

Basal Metabolism in Osseous Tuberculosis.—Topper determined the basal metabolic rates of fifty children with tuberculosis of bone both in the frankly active and in the apparently inactive stage. All these children were afebrile at the time of study and for long periods before and after study. Some of them have been followed for one and two years. The purpose of the investigation was to determine whether the basal metabolism could be used in the diagnosis of the activity of osseous tuberculosis. Thirty-six had normal basal metabolic rates, irrespective of whether the lesion was frankly active or apparently inactive. In this group the sedimentation rate of the erythrocytes did not parallel the metabolism. In fact, even in cases in which there was low grade fever (temperatures up to 100 or 101 F.) the metabolism was not increased. Similarly, in ten cases in which there were actively draining sinuses the metabolism was normal. The metabolism of fourteen children was found to be increased. Since the temperature of these children was for the most part normal and the osseous lesions similar to those of the thirty-six children with normal metabolism, further analysis was made to determine the cause for the increased metabolism. Of these fourteen children, all except two had active pulmonary tuberculosis of the primary type. This is consistent with previous observations of increased metabolism in pulmonary tuberculosis. Serial studies in some of these cases showed that when the tuberculous process in the lungs became inactive the metabolism returned to a normal level, irrespective of whether the osseous lesion was active or inactive. Therefore, for the diagnosis of activity in osseous tuberculosis one must depend on the roentgenogram, the leukocyte count, the sedimentation rate and clinical signs and symptoms of activity. The cause for increased metabolism in the childhood type of pulmonary tuberculosis as opposed to normal metabolism in other types of the infection is probably related to the extensive involvement of lymphatic tissue in this type of tuberculosis. The oxygen consumption of lymphatic tissue has been shown to be high, and it is especially so when the functional activity of such tissue is increased.

Iron Deficiency Anemia in Children.—According to Abbott and Ahmann, a study of hemoglobin values of 883 rural school children in Florida showed that 50 per cent of them were anemic and that 31 per cent had borderline anemia. The ratio between the number of children with the highest and the number with the lowest hemoglobin values was approximately 1 to 5. The administration of iron and ammonium citrates to 200 rural school children over forty-two days resulted in a rapid regeneration of hemoglobin. A diet high in iron-carrying foods produced an increase in hemoglobin in the forty-seven nursery school children so treated, but in cases of severe anemia, even after ninety days of the diet, the hemoglobin values remained subnormal.

American Journal of Hygiene, Baltimore

30: 33-62 Section A (Sept.) 1939. Partial Index
47-82 Section B
41-80 Section C
35-72 Section D

Section A

Short Method for Constructing an Abridged Life Table. L. J. Reed and Margaret Merrell, Baltimore.—p. 33.

Section B

Sensitization to Tuberculin Produced in Children by Heat-Killed Tubercle Bacilli. E. W. Flahiff, Kingston, Jamaica, British West Indies.—p. 65.

Occurrence of Tuberculosis in Persons Who Failed to React to Tuberculin and in Persons with Positive Tuberculin Reaction. E. W. Flahiff, Kingston, Jamaica, British West Indies.—p. 69.

Micro-Organisms of Salmonella Choleraesuis Group Isolated in the United States. D. W. Bruner and P. R. Edwards, Lexington, Ky.—p. 75.

Section C

Observations on Parasitization of Erythrocytes by Plasmodium Vivax, with Special Reference to Reticulocytes. G. Vryonis, Nashville, Tenn.—p. 41.

Experimental Infections in Anopheles Stephensi (Type) from Contrasting Larva Environments. P. F. Russell and B. N. Mohan, Guindy, Madras Presidency, India.—p. 73.

Section D

Experimental Studies on Course of Trichina Infection in Guinea Pigs: III. Immunity of Guinea Pigs to Reinfection with Trichinella Spiralis. H. Roth, Copenhagen, Denmark.—p. 35.

American Journal of Medical Jurisprudence, Boston

2: 301-336 (Aug.-Sept.) 1939

Barbiturate Poisoning: Review. M. Pijoan, Boston.—p. 301.
Preparation by Attorneys for Medicolegal Trials. J. R. Garner, Atlanta, Ga.—p. 313.
Problem of Interference with Radio Communication by Electromedical Apparatus. F. H. Krusen, Rochester, Minn.—p. 315.
Legal Aspects of Radiodontics. A. P. S. Sweet, Rochester, N. Y.—p. 323.
Medical Jurisprudence: The Medical Witness. A. M. Showalter, Christiansburg, Va.—p. 326.
Medicolegal Problems. A. W. Stearns, Boston.—p. 331.

American J. Obstetrics and Gynecology, St. Louis

38: 371-556 (Sept.) 1939. Partial Index

*Studies on Concentrations of Estrogenic and Gonadotropic Hormones in Serum of Pregnant Women. A. E. Rakoff, Philadelphia.—p. 371.
Growth of Fetus and Infant as Related to Mineral Intake During Pregnancy. W. W. Swanson and Vivian Iob, Chicago.—p. 382.
Evaluation of Human Vaginal Smear in Relationship to Histology of Vaginal Mucosa. S. H. Geist and U. J. Salmon, New York.—p. 392.
Changes in Uterine and Placental Circulations During Different Stages of Pregnancy. P. J. Kearns, Montreal.—p. 400.
*Complications Associated with Excessive Development of Human Fetus. A. K. Koff and Edith L. Potter, Chicago.—p. 412.
Factor of Anesthesia in Pathogenesis of Asphyxia Neonatorum. M. Rosenfeld and F. F. Snyder, Baltimore.—p. 424.
Certain Laboratory Findings and Interpretations in Eclampsia. L. C. Chesley, Jersey City, N. J.—p. 430.
*Bacillus Welchii Infections in Pregnancy: Review of Literature and Report of Seventeen Cases. P. B. Russell Jr. and M. J. Roach, Memphis, Tenn.—p. 437.
Prevention of Tuberculosis Begins Before Birth: Tuberculin Testing During Pregnancy as Fertile Field for Case Finding and Prevention. C. L. Ianne and J. C. Muir, San Jose, Calif.—p. 448.
Treatment of Menopause with Estradiol Dipropionate. E. M. Dorr and R. R. Greene, Chicago.—p. 458.
Surgical Treatment of Bilateral Polycystic Ovaries—Amenorrhea and Sterility. I. F. Stein and M. R. Cohen, Chicago.—p. 465.
Vitamin A Deficiencies in Pregnancy: Case Reports on Two Unusually Severe Examples. W. A. Ricketts, Dayton, Ohio.—p. 484.
Changes of Urinary Tract Associated with Prolapse of Uterus. A. J. Wallingford, Albany, N. Y.—p. 489.
Study of Cause of Hydramnios. J. R. Goodall, G. Morgan and R. H. Power, Montreal.—p. 494.
Concentration of Serum Sulfate During Pregnancy and Preeclamptic Toxemia. A. B. Hunt and E. G. Wakefield, Rochester, Minn.—p. 498.
Hidradenoma of Vulva. D. Rothman and S. H. Gray, St. Louis.—p. 509.
Carcinoma of Cervix in a Girl of 19 Years. H. Charache, Brooklyn.—p. 518.
Simple Technic for Craniotomy on High Aftercoming Head. G. W. Gustafson, Indianapolis.—p. 522.
Dietary Requirements in Pregnancy. W. J. Dieckmann and W. W. Swanson, Chicago.—p. 523.

Estrogenic and Gonadotropic Hormones in Pregnant Women.—Rakoff studied a simplified improved technic for the titration of estrogenic and gonadotropic hormones in the serum of pregnant women, which proved to be useful in following the concentrations of these hormones in normal gestation and in a number of the complications of pregnancy, especially the toxemias and abortion. The method requires from 20 to 50 cc. of blood. Estrogenic hormone was assayed by a modification of the Fluhmann technic. Gonadotropic hormone was titrated by a modification of the Aschheim-Zondek test. Whole serums were used as the test solutions and mice as the test animals. It was observed that the estrogen and gonadotropic hormone values on unextracted serums are much higher than those obtained on extracted specimens. Serum titrations repeated at frequent intervals gave much more consistent results than those obtained from urinary assays. A total of 162 serum titrations were conducted on forty normal pregnant women in various periods of gestation, and graphs were prepared showing the normal range and average values from the fourth week of gestation to term. Serum titrations conducted on a group of twenty-two patients with toxemias of late pregnancy usually showed abnormally high gonadotropic hormone and low estrogen values. The severity of the toxemia did not appear to be directly related to the degree of abnormality in gonadotropic hormone and estrogen values, except that those patients with marked edema showed unusually high gonadotropic hormone readings in the serum. Improvement in the clinical condition was generally associated with a return of the estrogen and gonadotropic hormone values to the normal range. Studies on three patients in whom titrations were available before the onset of toxemia showed in two instances high gonadotropic hormone values preceding the onset of toxemia by several weeks. These were later followed by low estrogen values. There was generally a reciprocal relationship between the rise and fall of estrogen and gonadotropic hormone. Three patients with nephritic toxemia showed high gonadotropic hormone and usually low estrogen values during the period of clinical toxemia. However, one patient with a glomerulonephritis, who had a history of nephritic toxemia and eclampsia in the previous pregnancy, showed normal values for estrogen and gonadotropic hormones, except during two periods associated with signs and symptoms of toxemia. When intra-uterine fetal death was suspected, repeated examinations of the serum for gonadotropic hormone furnished a better means of determining the fate of the fetus than did the Friedman test. With the author's technic when the gonadotropic hormone content of the serum fell to 50 mouse units per hundred cubic centimeters or less the Friedman test usually became negative. One patient with pernicious nausea and vomiting had a low gonadotropic hormone content of the serum, while the serum estrogen was normal.

Complications from Excessive Development of Fetus.—Koff and Potter say that, provided the pelvis is not contracted, it is rare for infants weighing less than 4,500 Gm. to give rise to dystocia due to size. It has been found, however, that delivery of an infant weighing more than 4,500 Gm. is frequently attended with serious difficulties. Investigating the incidence of the birth of excessively developed fetuses, the authors found that among 20,219 births at the Chicago Lying-in Hospital 195, or 0.94 per cent, of the infants weighed more than 4,500 Gm. Since the size of the fetus is largely dependent on the length of gestation, the authors investigated the duration of pregnancy (calculated from the first day of the last menstrual period) in the cases on which this study is based. The average length of gestation of the women with excessively developed fetuses was 288 days. This figure when compared with the figures for normal pregnancy demonstrates the direct relationship between prolongation of pregnancy and excessive development of the fetus. However, size of the parents, multiparity, advancing age, or diabetes in the mother may be contributing factors in producing excessive fetal development. Labor presents a greater hazard for both mother and offspring when overdevelopment of the fetus has occurred. The necessity for operative intervention is increased and the incidence of toxemia, of postpartum hemorrhage, of maternal morbidity and of fetal mortality is definitely higher than when the fetus is smaller. Accurate estimation of fetal size prior to delivery with consequent modification of the technic employed will decrease maternal complications and fetal mortality.

Bacillus Welchii Infections in Pregnancy.—Russell and Roach report their experiences in seventeen cases of Bacillus welchii infections occurring in their clinic. They differentiate the following types: (1) local gas gangrene, (2) emphysema of the uterine wall and (3) gas sepsis. They subdivide the latter type into (*a*) general sepsis and (*b*) metastatic gas gangrene. After discussing these various types they give their attention to the differential diagnosis, pointing out that the physical examination does not give much information in Bacillus welchii infections because the predominating symptom is tenderness of the lower part of the abdomen, uterus, liver, kidneys and spleen and all these may be tender in a simple case of abortion. The heart cycle and pulse rate are again of no value. Peritonitis is not found in the mild cases, but it is found in cases in which there is a general sepsis with or without emphysema and physometra. Cyanosis is one of the common symptoms which accompany Bacillus welchii infection but it is important to differentiate between that resulting from sulfanilamide therapy or that which is seen in the later stages of eclampsia. Jaundice is another symptom which occurs in the more severe cases but not in those which are classified as local infection. The odor of the patient suffering from a Bacillus welchii infection is not much different from that associated with typhoid. The pulse also is similar; however, the patient suffering from the Bacillus welchii infection has not the facies of anxiety found in the patient with typhoid. The temperature is usually lower in the former disease than in the latter, and the patient suffering from a Bacillus welchii infection has a cold and clammy skin in contradistinction to the hot and moist skin of the typhoid patient. Incontinence of urine and feces is a rather common occurrence in severe infections of Bacillus welchii. The exact diagnosis of

Bacillus welchii infection is not always easy. Laboratory observations and x-ray examination are the final criteria for the diagnosis. The treatment of this infection is varied and there is no preparation which will cure all cases. Massive doses of a polyvalent serum for streptococci and Bacillus welchii should be administered on admission. Strict isolation of the patient is of great importance. Because of the spore-bearing properties of Bacillus welchii, the authors insist that all instruments and materials be fractionally sterilized. Repeated intra-uterine cultures, douches and transfusions should be made as soon as the organism has been identified by smears and cultures. It is important also to combat acidosis, anemia and low urinary output. The senior author decided that hydrogen peroxide and 10 per cent dibrom-oxymercury-fluorescein solution would cause a gentle débridement of the necrotic materials; the liberated oxygen would destroy the anaerobes, and the dibrom-oxymercury-fluorescein would destroy those organisms causing the mixed infection found in the more severe cases. He suggests that these intra-uterine douches be repeated at least every other day because of the spore-bearing characteristics of Bacillus welchii. Vaginal instillations with the same mixture seemed to be efficacious in the treatment of the vaginal necrosis and were given twice daily. The authors emphasize that gas producing bacteria should be of extreme importance to doctors in contact with rural patients because these bacteria are often found in the intestinal tract of herbivorous animals.

Annals of Medical History, New York

1: 405-486 (Sept.) 1939

Henry Fraser Campbell. Cecilia C. Mettler and F. A. Mettler, Augusta, Georgia.—p. 405.
The Centenary of the Cell Doctrine. E. B. Krumbhaar, Philadelphia. —p. 427.
Medicine in the Life of François Rabelais. D. Slaughter, Dallas, Texas. —p. 438.
Early History of Gas Gangrene. C. E. Kellett, Newcastle-on-Tyne, England.—p. 452.
Century of American Medicine in Syria. A. A. Khairallah, Beirut, Syria.—p. 460.
The Aphorisms of Corvisart. A. L. McDonald, Duluth, Minn.—p. 471.

Archives of Physical Therapy, Chicago

20: 529-592 (Sept.) 1939

Short Wave Diathermy in Chronic Prostatitis: Preliminary Report. D. K. Hibbs, Chicago.—p. 533.
Electrosurgical Management of Bladder Neoplasms. H. Culver, Chicago.—p. 538.
Low Temperature Technic for Artificial Fever Induction. M. M. Cook, Minneapolis.—p. 544.
*Fever Therapy in Acute Rheumatic Disease. E. E. Simmons and F. L. Dunn, Omaha.—p. 547.
Present Status of Short Wave Diathermy. R. Kovács, New York.—p. 559.
Observations on Radiotherapy from the General Surgeon. D. D. Bowers, Indianapolis.—p. 567.

Fever Therapy in Acute Rheumatic Disease.—The effects of physically induced fever in thirty-one cases of acute rheumatic fever in which the Kettering hypertherm cabinet was used are reported by Simmons and Dunn. The patients have been under observation for from one month to three and one half years. In the group there were eleven cases of mitral stenosis, fourteen of systolic murmurs, one of acute pericarditis, one of pericarditis and effusion and one of acute carditis and a pulse deficit. Complete and prompt relief of joint pain and swelling was obtained in almost all cases. The periods of artificial fever (from 103 to 106 F.) varied from five to sixty-five hours. In no case was it possible to determine that the cardiac lesions were aggravated by fever therapy. The period of subclinical activity was shortened and in the cases of minimal cardiac involvement the murmurs disappeared. These results cannot be fully ascribed to the effect of fever therapy alone. Symptomatic relief from joint pain has been afforded regardless of the presence of significant foci of infection, but data on the prolonged effect of fever therapy on such foci are not had since they were removed subsequently. Fever therapy is not a substitute for the removal of significant foci of infection. Fifteen of twenty cases showed a sharp drop in the sedimentation rate during the course of or immediately following fever therapy. More time must elapse and larger groups must be observed before the position of fever therapy can be established, but the authors feel that it is of definite aid in the treatment of acute rheumatic fever.

Arkansas Medical Society Journal, Fort Smith

36: 103-122 (Oct.) 1939

Urogenital Tuberculosis. H. F. H. Jones and T. D. Brown, Little Rock. —p. 103.
Fractures and Dislocations of Neck. J. F. Shuffield, Little Rock.—p. 106.
Interpretation of Kidney Function Tests. C. E. De Angelis, Little Rock.—p. 109.

Canadian Medical Association Journal, Montreal

41: 223-322 (Sept.) 1939. Partial Index

Attempt to Inhibit Development of Tar Carcinoma in Mice (Fifth Report). J. R. Davidson, Winnipeg, Man.—p. 223.
*Treatment of Addison's Disease by Synthetic Adrenal Cortical Hormone (Desoxycorticosterone Acetate). R. A. Cleghorn, J. L. A. Fowler and J. S. Wenzel, Toronto.—p. 226.
Subcutaneous Emphysema Complicating Pertussis. E. M. Worden and A. F. Chaisson, Montreal.—p. 237.
*Clinical Applications of Electro-Encephalography. H. H. Hyland, J. E. Goodwin and G. E. Hall, Toronto.—p. 239.
Diabetic Infection and Gangrene. G. Murray, Toronto.—p. 246.
Hyperchromic Macrocytic Anemia in Association with Hodgkin's Disease. S. R. Townsend and A. L. Braunstein, Baltimore.—p. 254.
*Results of Self Selection of Diets by Young Children. Clara M. Davis, Winnetka, Ill.—p. 257.
Reactions from Sodium Morrhuate in Sclerosing of Varicose Veins. G. A. Holland, Montreal.—p. 262.
Active Immunization Against Whooping Cough. N. Silverthorne, Toronto.—p. 263.
Report of 116 Controlled Cases of Epilepsy. D. O. Lynch, Woodstock, Ont.—p. 266.
Pulmonary Embolism. B. Plewes, Toronto.—p. 271.
Action of Sulfonamide in Infective Colds. A. L. Yates, Halifax, N. S. —p. 275.
Untreated Taboparesis with Negative Spinal Fluid. C. H. Gundry, Brockville, Ont.—p. 287.

Desoxycorticosterone Acetate for Addison's Disease.—To date Cleghorn and his colleagues have used desoxycorticosterone acetate in nine cases of Addison's disease and in all there has been undoubted clinical improvement. The principal subjective benefit appears to be a greatly increased sense of well being and vigor. Objectively the blood pressure, serum sodium and body weight increase. Hemoconcentration disappears, as indicated by the fall in hemoglobin and the decrease in the percentage of erythrocytes. Added salt is tolerated better and the appetite improves. Desoxycorticosterone acetate has a definite advantage in that it can be given in small injections and is less painful than adrenal cortex extract. Cases of local reaction with fever following the use of desoxycorticosterone acetate in oil have been reported, but the authors believe that this is due to accidental subcutaneous injection. It must be injected intramuscularly. The danger of using the test recently described by Cutler, Power and Wilder (the withholding of salt) as being diagnostic for Addison's disease is emphasized.

Electro-Encephalography.—According to Hyland and his associates, the principal clinical value of the electro-encephalogram in its present stage of development, apart from the study of epilepsy, is in the localization of tumors which involve the cerebral cortex. In other organic diseases of the brain and in mental disorders the usefulness of the electro-encephalogram is still limited. Gross abnormalities in the recorded waves are usually absent in the majority of these conditions. Further repeated investigation is necessary, particularly in cases in which the otherwise normal "alpha" frequency is found to be below the commonly accepted normal minimum. These slow "alphas," 7½ per second or less, may be seen alone or in conjunction with other slow waves. While little is known regarding their significance, there is some evidence to indicate that they represent pathologic changes associated with an impairment of cortical function. Here again future investigations doubtless will result in improved methods of recording and in the interpretation of observations, so that the scope of the electro-encephalogram in diagnosis may be greatly increased.

Self Selection of Diets by Children.—Over a period of six years Davis observed the results on fifteen infants from the time of weaning (from 6 to 11 months of age) on a self selected diet. Each child was observed for not less than six months and all but two from one to four and a half years. Food was not offered to the infant either directly or by suggestion. The nurses' orders were to sit quietly by, spoon in hand, and make no motion, and only when the infant reached for or pointed to a dish might she take up a spoonful and, if he opened his mouth for it, put it in. He might eat with

his fingers or in any way he could without comment on or correction of his manners. The tray was taken away when he had definitely stopped eating, which was usually after from twenty to twenty-five minutes. The foods offered were weighed before and after the infant's selection. There were no failures of infants to manage their own diets; all had hearty appetites; all throve. Constipation was unknown among them and laxatives were never used or needed. Except in the presence of parenteral infection, there was no vomiting or diarrhea. Colds were usually of the mild three day type without complications of any kind. There were a few cases of tonsillitis but no serious illness among the children in the six years. The only epidemic disease to visit the nursery was acute glandular fever of Pfeiffer, with which all the children in the nursery came down like ninepins on the same day. During this epidemic trays were served as usual. This led to the observation that, just as loss of appetite often precedes by twenty-four to forty-eight hours every other discoverable sign and symptom of acute infection, so return of appetite precedes by twelve to twenty-four hours all other signs of convalescence, occurring when fever is still high and enabling the observer to predict its fall correctly. This eating of a hearty meal when fever is still high is often not in evidence when children are put on restricted diets during such illnesses. The correctness of the observation has been confirmed in the Children's Memorial Hospital, where a modification of the self-selective method of feeding prevails. During convalescence unusually large amounts of raw beef, carrots and beets were eaten. The demand for increased amounts of raw beef and carrots can be easily accounted for but for the beets; it may be possible that they furnish an antianemic substance (iron?). Beets were eaten by all in much larger quantities in the first six months or year after weaning than ever again save after colds and acute glandular fever. Whether appetite was or was not a competent guide to an adequate diet was checked by diets with nutritional laws and standards and it was found that the infants either approximated or exceeded the average daily calory requirement. There was a moderate preponderance of the potentially alkaline in every six months period in fourteen infants. The other one was observed for only six months. The food list was confined to natural, unprocessed and unpurified foods, without made dishes of any sort, and it reproduced to a large extent the conditions under which primitive peoples in many parts of the world have been shown to have had scientifically sound diets and excellent nutrition. By providing conditions under which appetite could function freely and beneficently the experiment resolved the modern conflict between appetite and nutritional requirements. It eliminated anorexia and the eating problems that are the plague of feeding by the dosage method.

Delaware State Medical Journal, Wilmington

11: 191-210 (Sept.) 1939

Modern Trends in Psychiatric Therapy. K. E. Appel and J. A. Flaherty, Philadelphia.—p. 191.

Psychoneuroses in Relation to General Medicine. A. Gordon, Philadelphia.—p. 197.

Florida Medical Association Journal, Jacksonville

26: 109-160 (Sept.) 1939

Some Observations on Treatment of Pellagra. J. F. Wilson, Jacksonville.—p. 123.

Thyroid and Adrenal Glands as Factors in Control of Fever: Heat Regulation and Climate. N. L. Spengler, Tampa.—p. 126.

Myocardial Infarction: Electrocardiographic Changes and Necropsy Findings. J. W. Annis, Lakeland.—p. 131.

Surgical Conditions Caused by Intestinal Parasites. T. H. Bates, Lake City.—p. 137.

Abdominal Foreign Body: Case Report. J. K. McShane, Miami.—p. 139.

Erythematous Lupus in Negro Youths: Case Report. J. L. Kirby-Smith, Jacksonville.—p. 141.

Georgia Medical Association Journal, Atlanta

28: 347-390 (Sept.) 1939

Some Phases of Medical Economics. H. H. Shoulders, Nashville, Tenn.—p. 347.

The Social and Economic Value of Health. R. F. Maddox, Atlanta.—p. 354.

Advances in Recognition and Treatment of Nutritional Disturbances. V. P. Sydenstricker, Augusta.—p. 359.

Effect of Nervous Influences on Digestion. E. F. Wahl, Thomasville.—p. 354.

Public Health Progress. S. C. Rutland, LaGrange.—p. 367.

Journal of Bacteriology, Baltimore

38: 249-354 (Sept.) 1939

Studies on Life and Death of Bacteria: I. Senescent Phase in Aging Cultures and Probable Mechanisms Involved. E. A. Steinhaus and J. M. Birkeland, Columbus, Ohio.—p. 249.

*Cultural Study of Filamentous Bacteria Obtained from Human Mouth. B. G. Bibby and G. P. Berry, Rochester, N. Y.—p. 263.

Optimal Temperature for Differentiation of Escherichia Coli from Other Coliform Bacteria. A. A. Hajna and C. A. Perry, Baltimore.—p. 275.

Some Growth Factors for Hemolytic Streptococci. D. W. Woolley and B. L. Hutchings, Madison, Wis.—p. 285.

Growth Factors for Bacteria: VIII. Pantothenic and Nicotinic Acids as Essential Growth Factors for Lactic and Propionic Acid Bacteria. E. E. Snell, F. M. Strong and W. H. Peterson, Madison, Wis.—p. 293.

Influence of Nicotinic Acid on Glucose Fermentation by Members of Colon-Typhoid Group of Bacteria. I. J. Kligler and N. Grosowitz, Jerusalem, Palestine.—p. 309.

Collodion Sac for Use in Animal Experimentation. A. H. Harris, Albany, N. Y.—p. 321.

Studies on Mode of Action of Sulfanilamide in Vitro. Julia T. Weld and Lucy C. Mitchell, New York.—p. 335.

Bacteria Obtained from Mouth.—By the use of anaerobic methods and of a wide variety of culture mediums, Bibby and Berry isolated from the mouth many strains of filamentous bacteria. On the basis of the morphology and the characteristics of growth of the eighty-three strains which were successfully carried in subculture, a tentative working division into seven groups is proposed. Six of these have distinct characteristics. Only two, however, can be identified with organisms which have been isolated by previous investigators, although organisms showing some resemblance to a third group have been described. Four of the groups of filaments have the characteristics of the genus Leptotrichia, one of the genus Fusiformis and one of both genera. Of all the groups, only one embraced strains all of which were alike in biologic properties. For these organisms the authors suggest the name Leptotrichia buccalis because they represent the most commonly isolated of the culturable oral filaments.

Journal of Immunology, Baltimore

37: 179-304 (Sept.) 1939. Partial Index

*Agglutinative Reaction in Relation to Pertussis and to Prophylactic Vaccination Against Pertussis, with Description of New Technic, J. J. Miller Jr. and Rosalie J. Silverberg, San Francisco.—p. 207.

New Schick Toxin. E. M. Taylor and P. J. Moloney, Toronto.—p. 223.

Complement Fixation and Precipitative Tests in Poliomyelitis. J. A. Harrison, Philadelphia.—p. 233.

Studies of Sparing Effect of Lymphocytic Choriomeningitis on Experimental Poliomyelitis: I. Effect on Infectivity of Monkey Tissues. G. Dalldorf, Valhalla, N. Y.—p. 245.

Group Specific Differentiation of Organs of Man: Type Specific M Factors and N Factors in Organs. P. N. Kosjakov and G. P. Tribulev, Moscow, Soviet Union.—p. 283.

Effect of Temperature and Drying on M Factors and N Factors of Human Blood. P. N. Kosjakov and G. P. Tribulev, Moscow, Soviet Union.—p. 297.

Agglutinative Reaction and Pertussis.—Miller and Silverberg describe a new technic of tube agglutination for Haemophilus pertussis. Mechanical rocking of the tubes for two hours at room temperature is sufficient. A twenty-four hour growth of Haemophilus pertussis is used. The small amount of serum required (0.1 cc.) may be collected in a Lyon tube by ear or toe puncture. The serums from ten of 101 children with negative histories for pertussis produced agglutination, but in children less than 5 years of age the agglutinative titers in the positive serums were not higher than 1:20. The serums from 161 of 164 children who had been injected with phase I Haemophilus pertussis vaccine produced agglutination. The titers of the positive serums were in general high, usually 1:160 or higher. Second and occasionally third specimens of serum were obtained at wide intervals up to thirty-eight months after vaccination and these showed a tendency to maintain their titer. The serums from fifteen of seventeen children with pertussis produced agglutination at some time during the disease. The titer of agglutination attained was extremely variable and seldom more than 1:160. The serums from thirty-six of sixty-seven children who had recently recovered from pertussis produced agglutination. On retesting after intervals of several months consistent decreases in titer were observed. Many serums had become negative though occasional serums produced agglutination up to twenty-five months after the onset of the disease.

Medical Annals of District of Columbia, Washington

8: 255-284 (Sept.) 1939

*Phenolphthalein Eruptions: Report of Three Cases. I. L. Sandler, Washington.—p. 255.
General Considerations and Differential Diagnosis of Jaundice Depicted by Cryptograms. W. M. Yater, Washington.—p. 258.
Surgical Considerations of Jaundice. A. Horwitz, Washington.—p. 261.
Physiology of Digestion. E. C. Albritton, Washington.—p. 265.
Comparison of Roentgen and Gastroscopic Findings in Diseases of Stomach. J. F. Elward, Washington.—p. 269.

Phenolphthalein Eruptions. — Sandler discusses phenolphthalein eruptions and reports three such cases, one of which leads him to believe that phenolphthalein is present in the skin in the early stage of the eruption. The author finds no reference to a similar observation in the literature. It has been stated that except for the ingestion test no other forms of testing have been evolved which are of value in the diagnosis or prognosis of existing hypersensitiveness to the drug. The author shows that the oral administration of a small dose (0.0065 Gm.) of the suspected drug is the best method of determining the causative agent. In his cases, in about one hour after its administration, edema of the lips with deep seated vesicles occurred and the hue in the fixed phenolphthalein lesions was greatly accentuated.

Michigan State Medical Society Journal, Lansing

38: 837-924 (Oct.) 1939

What Price Depression? R. Sleyster, Wauwatosa, Wis.—p. 853.
Ideals. H. A. Luce, Detroit.—p. 859.
Poliomyelitis. H. B. Rothbart, Detroit.—p. 861.
Survey of Syphilis in Oakland County for 1938. The Committee on Syphilis of the Oakland County Medical Society.—p. 867.
Our Changing Medical Service. A. H. Miller, Gladstone.—p. 869.
Carbon Monoxide Poisoning. W. D. McNally, Chicago.—p. 871.
Massive Gangrene of Colon Secondary to Acute Appendicitis. V. W. Jensen, Shelby.—p. 877.
Two "Liver Deaths" Following Ovariotomy. H. W. Hewitt, Detroit.—p. 879.
Blood Groups and Their Medicolegal Applications. A. W. Frisch, Detroit.—p. 881.
Luminal and Postoperative Temperature. B. F. Gariepy, Royal Oak.—p. 887.
Report of an Isolated Case of Paratyphoid B. F. L. Graubner, Marshall.—p. 888.
Role of Allergy in Some Dermatoses of Questionable Etiology. H. L. Keim, Detroit.—p. 888.
Fundamentals of Treatment in Gynecology. H. M. Kirschbaum, Detroit.—p. 891.

New England Journal of Medicine, Boston

221: 403-444 (Sept. 14) 1939

Prothrombin and Vitamin K Therapy. J. D. Stewart and G. Margaret Rourke, Boston.—p. 403.
*Use of Cobra Venom in Relief of Intractable Pain. R. N. Rutherford, Brookline, Mass.—p. 408.
Practical Psychotherapy with Adolescents: Brief Survey of the Field for the General Practitioner. D. J. Sullivan and N. B. Flanagan, Boston.—p. 414.
Benno Reinhardt, 1819-1852: Biographic Study and Contribution to Early History of Virchows Archiv. G. J. Newerla, Albany, N. Y.—p. 419.
Report on Medical Progress: Physical Therapy. F. P. Lowry, Newton, Mass.—p. 424.

Cobra Venom for Intractable Pain. — Rutherford used cobra venom for the relief of intractable pain in seventeen cases, generally because of terminal cancer. It is important that the drug be given intramuscularly, for if it is given subcutaneously it will cause local redness and tenderness for several days. At the beginning of the series, treatment was started with an injection of 0.5 cc. (2½ mouse units), followed by daily injections of 1 cc. (5 mouse units). Later the author endeavored to adjust the initial dose to the requirements of the patient, beginning in some cases with 2 or 3 cc. (10 or 15 mouse units) and continuing the dosage at that level for from four to six days or until complete relief was obtained, and then considerably lowering the dose to a maintenance level. Eight of the seventeen patients (46 per cent) considered themselves completely relieved. Four of the group (24 per cent) estimated their relief at from 75 to 95 per cent. Three (18 per cent) estimated their relief at from 50 to 75 per cent. In only two did the amount of relief fall below 50 per cent. In other words, nearly 50 per cent of the patients were completely relieved of pain and in 88 per cent the relief was 50 per cent or more. If there is a response it usually begins on the third or fourth day of injection, despite the amount used, and is complete by the sixth or seventh day. The benefits are not likely to increase after that time, but the relief of pain is likely to continue at that level, even though the amount of cobra venom is reduced to a maintenance level, determined by the patient. The majority of patients were able to maintain their relief on one ampule every other day or one a day, although several required two or three a day. There were no side reactions and there was no evidence that increasing amounts of the drug were necessary. The drug seemed to act on pain no matter what its etiology. When relief from pain is obtained the mental outlook and general health of the patients are benefited by release from the sharp drag of constant pain. Some patients are able to return to their work and to become wage earners again. In those who are only partially helped, the drug makes an excellent basal analgesic which can be augmented by analgesics that are not habit forming. This avoids the danger of morphine addiction and increasing opiate tolerance. For those patients who are not helped, intrathecal alcohol injection or chordotomy should be considered. Since cobra venom can be self administered, it makes an ideal outpatient treatment or treatment which can easily be followed by the general practitioner in the nonhospitalized case. There is no evidence of danger of addiction, increasing tolerance or toxicity of the drug.

New Jersey Medical Society Journal, Trenton

36: 525-568 (Sept.) 1939

Value of Roentgen Therapy in Acute Subacromial Bursitis. W. G. Herrman, Asbury Park.—p. 529.
The Eye in Diabetes. S. Schulsinger, Newark.—p. 533.
Histology of Radiation Effects in Inflammatory Conditions. R. Pomeranz, Newark.—p. 536.
Cystocele. J. W. Davies, New York.—p. 538.
Chronic Paranasal Sinusitis, a Medical Problem. G. H. Lathrope, Newark.—p. 542.
The Medical Approach to Gallbladder Problem. S. B. Kaplan, Newark.—p. 550.

New Orleans Medical and Surgical Journal

92: 171-234 (Oct.) 1939

Extra-Uterine Pregnancy. C. P. Gray and C. P. Gray Jr., Monroe, La.—p. 171.
Management of Urinary Infections in Pregnancy. U. S. Hargrove, Baton Rouge, La.—p. 176.
The Twisted Nose. W. R. Metz, New Orleans.—p. 180.
Treatment of Empyema. R. M. Penick Jr., New Orleans.—p. 185.
Some Problems in Surgical Treatment of Thyroid Disease. J. E. Heard, Shreveport, La.—p. 190.
Cataract. G. M. Haik, New Orleans.—p. 195.
Mode of Action of X-Rays in Otitis Media. L. L. Titche, Monroe, La.—p. 203.
Acute Spinal Epidural Abscess: Report of Four Cases. J. O. Weilbaecher Jr., New Orleans.—p. 208.

Oklahoma State Medical Assn. Journal, McAlester

32: 317-358 (Sept.) 1939

Experiences with Internal Fixation in Fractures of Hip. C. R. Rountree, Oklahoma City.—p. 317.
Removal of Nonmagnetic Foreign Bodies from Vitreous: Report of Case. J. J. Caviness, Oklahoma City.—p. 326.
Practical Management in Peripheral Vascular Disease. B. E. Mulvey, Oklahoma City.—p. 330.
Interstitial Radium Treatment of Cancer of Lower Lip. L. K. Chont, Oklahoma City.—p. 334.
*Use of Autohemotherapy Reinforced with Artificial Fever in Treatment of Rheumatic Disease. W. K. Ishmael, Oklahoma City.—p. 337.

Autohemotherapy and Hyperpyrexia for Rheumatic Disease.—As an increase in the body temperature is a natural defense mechanism, it occurred to Ishmael that the artificial fever may reinforce the reaction of the injected blood (autohemotherapy). Based on this idea he applied these measures to 168 rheumatic patients. From 10 to 20 cc. of blood was withdrawn and immediately reinjected into the muscles of the hip. This is done before clotting takes place and nothing need be added to the blood. The artificial fever is instituted immediately following the autotransfusion and a temperature of 101.5 F. for one hour, the inductotherm being used for adults and intravenous typhoid vaccine for children. With inductothermy, approximately one hour was required to reach 101.5 F.; this temperature was maintained for one hour and about two hours was necessary for the temperature to return to normal. Patients were allowed to eat a normal meal before the fever was started and occasionally from 10 to 25 grains (0.65 to 1.6 Gm.) of sodium chloride was supplied along with ample fluids. No untoward reactions have been experienced and

patients resume their normal activities when the temperature returns to normal. Optimal results were obtained when the procedure was repeated every four days. In the average case, from six to ten treatments were given. The most striking results were obtained in acutely inflamed joints. Forty-four such cases were treated by this combined rapid desensitization method and all responded completely in an average of seventy-six hours. In none have there been any recurrences. To date the types of joints treated in the acute phase included seven of acute gonococcic arthritis, two of acute gouty arthritis, fifteen of acute infectious (atrophic) arthritis and twenty diagnosed as acute fibrositis. All these cases were in the acute phase and not chronic exacerbations. In the acute gonorrheal cases the urethritis had to be treated by other measures after the joint and sedimentation time had returned to normal. Twenty patients with rheumatic fever received artificial fever of 104 F. for an average total of eight hours; fifteen had complete remission and five "improved." Those receiving only autohemotherapy or fever of 101.5 F. or less failed to improve. Of ten patients with chronic infectious arthritis given combined therapy, one had a remission in four weeks, four were improved, five had no effect and none suffered an exacerbation. Three others given fever only (101 F. for one hour) had no remissions, only one improved and there were no exacerbations. Three similar patients given only autohemotherapy had no remissions, two "improved," the condition of one remained unchanged and none flared up. Thirteen patients diagnosed as having chronic fibrositis received the combined therapy, fifteen only the fever and two the autohemotherapy only. Twelve of the thirteen had a remission and one was improved. Fourteen of the fifteen had a remission and one was improved. Of the two receiving only the autohemotherapy, none had a remission and two were "improved." In the group diagnosed as having hypertrophic arthritis (menopause arthralgias) the main effects of the autohemotherapy seem to be in the delayed absorption afforded by the presence of the blood. In the thirty cases exhibiting rheumatic exacerbations, from three to five days prior to and during each menstrual period autohemotherapy alone was used and complete remissions were seen in twenty-six of the thirty cases treated. Three were "improved" and one was unimproved. Nine women received the combined therapy, eight have complete remission and one was "improved."

Public Health Reports, Washington, D. C.

54: 1663-1708 (Sept. 15) 1939

The National Health Survey: Scope and Method of Nationwide Canvass of Sickness in Relation to Its Social and Economic Setting. G. St. J. Perrott, C. Tibbitts and R. H. Britten.—p. 1663.

Two New Species of Opisocrostis (Siphonaptera). N. E. Good and F. M. Prince.—p. 1687.

Radiology, Syracuse, N. Y.

33: 261-420 (Sept.) 1939. Partial Index

Roentgenologic Diagnosis of Pneumoconiosis (Silicosis) and Use of "Electric Eye" to Determine Regional Densities. L. G. Cole and W. G. Cole, New York.—p. 261.

Primary Ulcer of Jejunum. J. Buckstein, New York.—p. 299.

Bone Rarefaction After Trauma to Large Joint Regions Without Fracture. H. L. Jaffe, New York.—p. 305.

Tangential Irradiation of Breast Carcinoma. N. S. Finzi, London, England.—p. 312.

Chronic Recurrent Intestinal Intussusception. M. G. Wasch and B. S. Epstein, Brooklyn.—p. 316.

*X-Ray Therapy in Treatment of Acute Pneumonia: Report Covering Use of X-Ray Therapy in Treatment of Pneumonia at the Niagara Falls Memorial Hospital from Oct. 1, 1937, to Sept. 30, 1938. W. R. Scott, Niagara Falls, N. Y.—p. 331.

Lipiodol Granuloma in Fallopian Tubes Localized by Intra-Uterine Diodrast Injection, with Special Reference to Value of Follow-Up X-Ray Films. I. C. Rubin, New York.—p. 350.

Hodgkin's Disease. L. J. Friedman, New York.—p. 354.

Consideration of Polycythemia and Grenz Ray Therapy. G. Bucky and J. Uttal, New York.—p. 377.

*Importance of Sacro-Iliac Changes in Early Diagnosis of Ankylosing Spondylarthritis: Marie-Strümpell-Bechterew Disease. J. Forestier, Aix-les-Bains, France.—p. 389.

Roentgen Therapy for Pneumonia.—The results obtained with roentgen therapy in eighty-eight cases of acute pneumonia seen during a period of one year at the Niagara Falls Memorial Hospital, Scott believes, indicate that there is a definite field for this type of therapy. Whenever possible the patient was treated immediately on admission to the hospital and before being taken to his room. The factors used were 75 kilovolts, 3 mm. of aluminum filter, 200 roentgens, an open lead glass bowl type of tube holder with a 15 cm. opening centering over the area of chief consolidation (determined by a previous roentgenogram) without a cone or other method of screening off the rest of the chest. In bronchopneumonia the treatment was usually centered over the area which showed most confluence of mottling but without exclusion of the entire chest. The ages of the patients varied from 3 weeks to 76 years. In the patients who passed through the x-ray department the mortality rate was approximately 4 per cent lower than the general hospital pneumonia death rate for the twelve months under consideration. Also there was a marked difference between the patients who were given roentgen therapy and/or roentgenographed for diagnosis and those who did not visit the x-ray department at all; that is, the difference between 19.5 (including the eighty-eight patients who were given roentgen treatment and fifty of whose chests roentgenograms only were taken) and 44.1 per cent. Patients frequently look better and feel better within a short time after the treatment. It frequently happens that a definite fall in temperature occurs in from twelve to twenty-four hours after treatment, subsequently followed by a rise or occasionally by a rise showing two peaks, but then the temperature may proceed rather rapidly to normal. If the patient appears better, whether the temperature shows an abrupt drop or not, his clinical appearance is considered rather than temperature record and he is not treated for two or three days unless there seems to be need for it. Often by this time the temperature is going down and no further treatment is necessary. A second treatment was needed in only a few cases. The rapid improvement in the condition of most patients who had roentgen therapy early was frequently startling. Averaging the eighty-eight cases, a death rate for all cases in which any type of roentgen treatment was given, no matter what else was done, was 19.3 per cent. The average hospitalization time for the 138 cases of pneumonia was 15.9 days for males and 13.9 days for females. The hospital time of a patient treated chiefly by roentgen therapy was definitely shorter than the time required by one receiving roentgen and other methods of treatment; approximately one half the time. If the length of hospitalization is cut in half, certainly the cost to the patient is cut. The frequency of complications definitely seemed to be lessened. As long as the patients were even roentgenographed the death rate was lower; as compared to patients not even roentgenographed the percentage in favor of some form of roentgen therapy seems almost incredible. Contraindications appear to be nil, whereas other types of medication, especially serum, may be definitely contraindicated. Any other treatment desired by the attending physician may be given in conjunction with roentgen therapy. No reactions to the treatment were observed. Further reports on this problem are necessary to estimate accurately the value of roentgen therapy for pneumonia.

Sacro-Iliac Changes in Spondylarthritis.—After reviewing 153 cases of ankylosing spondylarthritis, some of which have been followed for many years, Forestier declares that: 1. The condition occurs rarely in women. 2. Patients frequently give a previous history of genital infection: prostate, seminal vesicles or rectosigmoidal disturbances. 3. The disease has a low-grade evolution; the onset is often difficult to determine. It progresses upward from the pelvis to the cervical region and to the lower joints of the extremities. 4. The x-ray changes in the sacro-iliacs are contemporary of the early and confused low back symptoms and precede, in most cases, vertebral involvement. From these deductions the author presents a pathogenesis of the disease which he believes may explain completely its special features. He believes that the primary focus in ankylosing spondylarthritis is in the genito-urinary system or in the lower intestine and that the toxic products excreted by this focus are drained into the lymphatic system of the pelvis and from here alongside the spine. In a man, the lymphatic vessels from the prostate and the seminal vesicles pass, on both sides of the medial line, in front of each sacro-iliac joint and extend upward in the posterior part of the abdomen on both sides of the spinal column just in front of

the apophysial joints, with which they have many connections. They are directly applied on the vertebral column behind the aorta and the vena cava. In a woman, the lymphatic vessels of the uterus and the vagina follow approximately the same path and also lie near the intervertebral joints. Conversely, the lymphatic vessels of the fallopian tubes and of the ovaries are much more laterally situated in the pelvis, and when they come up into the abdomen they lie on the ventral aspect of the large blood vessels—the aorta and vena cava. Since the draining of the uterus and vagina is far easier than that of the ovaries and tubes, the infrequent occurrence of ankylosing spondylarthritis among women can be understood. This theory, the author believes, explains the slow progress of the disease, first to the sacro-iliac joints and later ascending along the different segments of the spine. The sacro-iliac joints were roentgenographically involved in more than 98 per cent of the 153 cases. From the x-ray examination of twelve cases observed in the early stages of the disease, evidence is given that sacro-iliac joints are involved previously to any changes of the spine. The reverse has not been observed.

Rocky Mountain Medical Journal, Denver

36: 685-748 (Oct.) 1939

Is the Child Ready for School? E. Jackson, Denver.—p. 703.
Causes of Dizziness. K. G. Cooper, Denver.—p. 703.
Transurethral Prostatic Resection. H. Buchtel, Denver.—p. 708.
Essential Hypertension: General Consideration and Surgical Treatment by Resection of Splanchnic Nerves and Celiac and First and Second Lumbar Ganglions and Intervening Trunks. W. R. Lipscomb, Denver. —p. 715.

Southwestern Medicine, El Paso, Texas

23: 281-318 (Sept.) 1939

Malignancies of Female Genital Tract. J. W. Cathcart, El Paso, Texas. —p. 281.
Medical Control of Silicosis. F. T. Hogeland, Cananea, Sonora, Mexico. —p. 284.
Proctology for the General Practitioner. W. H. Daniel, Los Angeles. —p. 287.
Diabetes Mellitus: Analysis of Cases Treated with Protamine Zinc Insulin. L. B. Smith, Phoenix, Ariz.—p. 289.
Angina Pectoris and Its Masquerades. G. Werley, El Paso, Texas.—p. 294.
Case Specific Bacterial Vaccines. O. H. Brown, Phoenix, Ariz.—p. 297.
Gastroscopy as Diagnostic Procedure. N. Giere, El Paso, Texas.—p. 299.

Tennessee State Medical Assn. Journal, Nashville

32: 303-338 (Sept.) 1939

Acute Abdominal Emergencies: Report of Some Interesting Cases. J. B. Haskins, Chattanooga.—p. 303.
A Doctor Looks at Socialized Medicine and Raises the Question: Shall the First Aim of Medical Service Be Quality or Quantity? E. L. Shore, Atlantic City, N. J.—p. 314.
Leukemia. R. H. Monger, Knoxville.—p. 319.

Texas State Journal of Medicine, Fort Worth

35: 325-384 (Sept.) 1939

Rabies. G. K. Wassell, Dallas.—p. 330.
Varying Virulence of Hemolytic Streptococci: Determination of Serum Sulfanilamide. T. W. Folbre, San Antonio.—p. 336.
*Atypical Pneumonia with Leukopenia. J. R. Maxfield Jr., San Francisco. —p. 340.
Use of Sulfapyridine in Pneumonias of Early Life. H. L. Moore, Dallas.—p. 346.
Rocky Mountain Spotted Fever: Report of Case. W. S. McDaniel, Houston.—p. 348.
*Tularemia: Report of Case Treated with Sulfanilamide and Antiserum. G. L. Powers and Evelyn Gass Powers, Amarillo.—p. 350.
Drugs in Treatment of Congenital Syphilis. J. E. Ashby and H. Moore, Dallas.—p. 353.
Evaluation of Endocrine Therapy in Menstrual Disorders. H. R. Robinson, Galveston.—p. 357.
Review of 2,422 Cases of Contraception. J. Z. Gaston, Houston.—p. 365.
Maternal and Child Health Demonstration Program in Health Education. J. M. Coleman, Austin.—p. 368.
Recurrent Familial Headaches (Migraine). V. R. Hurst, Longview.—p. 372.

Atypical Pneumonia with Leukopenia.—Maxfield states that recently sixty-three cases of an atypical pneumonia with leukopenia have been seen in Baylor Hospital, Dallas, Texas. These pneumonias seem to be a clinical entity. There was usually a prodromal stage of from five to ten days. The disease started with dryness of the throat and some soreness. The symptoms of a mild upper respiratory infection, general malaise and mild to severe headaches were observed. The patient became progressively worse. A rapid change with onset of fever and usually a chilly sensation then occurred. Pain and fulness in the chest often occurred at this time. The patient's face showed anxiety and there was an elevation of temperature (from 102 to 104 F.) and an increase in the pulse and respiratory rate. There was usually a productive cough frequently accompanied by hemoptysis, which was followed in a few days by a coarse, dry, nonproductive cough which persisted even after the temperature returned to normal. This occurred between the fifth and the tenth day after admission. Although a diligent effort has been made, the causative organism has not been determined. A virus is strongly suspected. Repeated examinations of the sputum revealed acid fast organisms in only one instance and this patient had a previous history of tuberculosis. Repeated throat cultures and smears showed only normal organisms of the mouth and throat, with a gram-negative short chain nonhemolytic streptococcus in a few cases. In a few instances pneumococci were found. When these pneumococci were typed, no capsular swelling was observed with types I through XXXII of the Neufeld pneumococcus typing serum. The blood picture was that of a mild leukopenia, varying from 4,000 to 12,000 leukocytes per cubic centimeter of blood, with 82 per cent of the cases giving a leukocyte count of less than 8,000. The mononuclear leukocytes were 8 per cent or above in 38 per cent of the cases. The neutrophils varied from 40 to 80 per cent, the average being 61 per cent. A communicable factor was present, since the disease developed following contact with patients in eight nurses, four interns and three of the attending staff of Baylor Hospital. Two of the patients had a relapse, one four weeks and one three months after discharge from the hospital. The x-ray appearance of the lesions was usually infiltrative in character. They had feathery, indefinite edges with moderate homogeneous density toward their inner portions. The size of the lesions varied from those that were barely demonstrable in the roentgenograms to an almost complete involvement of both lung fields. Those cases with involvement of more than one lobe showed no increase of symptoms. There was a wide variation in the location and appearance of the lesions. Therapy was of a symptomatic and expectant nature. However, tincture of benzoin inhalations, steam inhalations, sulfanilamide, blood transfusions, nonspecific protein therapy and opiates for pain and persistent cough and the like were used. There were no mortalities. The duration of symptoms did not seem to be either shortened or lengthened by the type of treatment used. The author feels that the prognosis is good in all cases so long as the leukopenia exists and repeated bacteriologic studies fail to reveal typable pneumococci, tubercle bacilli, virulent streptococci or viruses of influenza, psittacosis or others. In the differential diagnosis typhoid, undulant fever, psittacosis, tuberculous pneumonia, influenza, influenzal pneumonia, tularemia and coccidioidal granuloma should be considered.

Tularemia.—In reporting their case of tularemia, G. L. and Evelyn Powers wish to call attention to the fact that the disease occurs in all parts of the United States. They believe that theirs is the first case in which treatment with sulfanilamide and antiserum was successful.

Wisconsin Medical Journal, Madison

38: 709-840 (Sept.) 1939

Gastrointestinal Disturbances Among Infants and Children. R. L. J. Kennedy, Rochester, Minn.—p. 727.
*Angina Pectoris and Tobacco Smoking: Presentation of Three Cases with Electrocardiographic Records. B. J. Birk and H. H. Huber, Milwaukee.—p. 733.
Perforating Hemorrhagic (Chocolate) Cysts of Ovary. C. B. Hatleberg, Chippewa Falls.—p. 736.
Results of Routine Examinations of Candidates for Teachers' Certificates at the University of Wisconsin, 1937-1938. L. R. Cole, Madison, and P. H. Schmiedicke, Marinette.—p. 740.
Significance of Hematuria. H. L. Kretschmer, Chicago.—p. 742.

Angina Pectoris and Tobacco Smoking.—Three patients exhibiting the syndrome of angina pectoris caused by smoking were seen by Birk and Huber. They obtained electrocardiograms when the patients sought relief from their symptoms and again when the underlying offending factor (smoking) was removed, after which the electrocardiograms were normal and the patients felt well. The changes noted in the electrocardiograms were definite. One of the patients with angina pectoris caused by tobacco smoking was a woman.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

36: 171-250 (July-Sept.) 1939

Diphtheritic Infection of Umbilicus. A. R. Thompson.—p. 171.
Congenital Abnormalities of Gallbladder and Extrahepatic Ducts: Review of 245 Reported Cases with Reports of Thirty-One Unpublished Cases. E. Stolkind.—p. 182.

British Medical Journal, London

2: 631-670 (Sept. 23) 1939

Significance of Auditory and Visual Hallucinations. P. K. McCowan.—p. 631.
Neurologic Aspect of Visual and Auditory Hallucinations. M. Critchley.—p. 634.
*Puerperal Sepsis and Hemolytic Streptococci. Amy M. Fleming.—p. 639.
Ophthalmic Services to Civil Population in National Emergency. A. Sorsby.—p. 641.
*Sulfanilamide in Treatment of Scarlet Fever. E. C. Benn.—p. 644.

Puerperal Sepsis and Hemolytic Streptococci.—Since evidence is accumulating that the upper part of the respiratory tract of the patient herself or her contacts is the most probable source of puerperal infection with hemolytic streptococci Fleming, with a view of preventing the transfer of these organisms to the genital tract of pregnant women immediately before, during and after childbirth, determined the incidence of group A hemolytic streptococci in 120 women medical students before they began their work in the maternity wards of the obstetric and gynecologic unit of the Royal Free Hospital. In each case the throat swab was taken about three weeks before the student was due for her two and a half months of resident training in the hospital. If a growth of streptococci was found, McLeod's test was carried out to see if it showed soluble hemolysin, and, if it did, the Lancefield group to which the hemolytic streptococci belonged was ascertained by the precipitin reaction. A growth of hemolytic streptococci was obtained in 22.5 per cent of the cases. In only five of the 120 students examined—that is, in 4.2 per cent—did the hemolytic streptococcus belong to the Lancefield group A. The series, spread over two years, gave no evidence of any seasonal variation in the frequency of the carrier rate of all hemolytic streptococci or of Lancefield group A. There was no evidence of any relation between the incidence of hemolytic streptococci in the throat belonging to group A and the presence of tonsillar tissue. Complete tonsillectomy had been performed in about 50 per cent of the students. Hemolytic streptococci were absent in as large a proportion of students with tonsils or remnants of tonsils as of those in whom complete tonsillectomy had been performed. Each student with hemolytic streptococci was given leave of absence, and moderate exercise in the open air, painting or gargling of the throat or the administration of sulfanilamide compounds was recommended. Whenever it ceased to be possible to grow group A streptococci from their throat swabs the students were considered fit to begin their residence. The time required for treatment varied, but the persistence of the positive throat swab was noticeable in those students whose nasopharynxes were in an unsatisfactory condition. From an inquiry into the medical work previous to obstetrics there seems ground for the suggestion that the curriculum of medical students should be so arranged that work in the children's wards should not immediately precede or be contemporary with work in obstetrics unless special steps are taken to control the carrier rate in the children's wards. Those in contact with respiratory ailments should exercise particular care, with the knowledge that their own susceptibility to act as carriers of group A hemolytic streptococci may be an important factor in the transmission of the infecting organism of puerperal fever. Only on four occasions during these two years, when throat swabs were examined because puerperal pyrexia had developed in a patient, were hemolytic streptococci found in the patient's throat. The same strain of hemolytic streptococci was isolated from the cervix of one of the patients and also from the throats of a student and a nurse in contact. In only one of the other cases was a student found to be a carrier. It appears that routine examination of throat swabs of the medical and nursing staffs is indicated.

Sulfanilamide for Scarlet Fever.—Since January 1937 Benn treated 256 patients with scarlet fever with sulfanilamide (Bayer), and 261 control patients were simultaneously treated without the drug. Antiscarlatinal serum was given to those patients in both groups who were thought to require it, irrespective of the sulfanilamide. It was realized that sulfanilamide has little or no effect in the acute febrile stage of scarlet fever, except perhaps in patients with a frankly septic type of the disease; therefore it was thought that the incidence of complications (which occur more often in children less than 10 years of age) would probably give the best indication of the value of the drug. The general treatment of the patients did not differ in the two groups. The amount (divided into three equal doses in twenty-four hours) of sulfanilamide, after a previous trial period, was fixed at 0.75 Gm. for children less than 2 years of age, 1.5 Gm. for children from 3 to 7 and 3 Gm. for those from 8 to 10. Administration of the drug was continued until the temperature had been normal for a week in uncomplicated cases. If complications developed, administration was prolonged for as long as was indicated. Signs of sulfanilamide toxemia were seen infrequently and in no case gave rise to anxiety. All patients suffered from simple scarlet fever, and no death occurred in either series. The early acute stage of scarlet fever seemed to be uninfluenced by sulfanilamide except in cases in which some septic element was apparent: The subseptic patients appeared to benefit from the drug. There were a total of forty-eight complications in the test group as compared to eighty-one in the control group. Individual complications, with two exceptions, showed a greater frequency in the control group than in the test group, and certain complications, including rheumatism, endocarditis and myocarditis, were absent from the test series but present in the control cases. The incidence of suppurative otitis media was greater in the control series than in the test series, 10.3 and 6.3 per cent, respectively. It appears that an important action of sulfanilamide in the mild type of scarlet fever is prophylactic in that it lowers the incidence of complications. For this reason seventy-nine patients have been given 1 Gm. of sulfanilamide daily, in four equal doses, from admission until the fourteenth day and again from the twenty-first to the twenty-eighth day. The results in these seventy-nine are sufficiently good (there were only four cases of suppurative otitis media, two of adenitis, two of paronychia and one of albuminuria) to encourage further prophylactic trial. The most striking effect is the comparative absence of the many minor septic sequels. Cyanosis was not encountered in this group, but a maculopapular erythema of morbilliform type, which first appeared on the extremities, then on the face and finally on the body, occurred in two cases. In one patient this was accompanied by pyrexia, which subsided within forty-eight hours after the drug was withdrawn. No other toxic effects were encountered.

Lancet, London

2: 675-722 (Sept. 23) 1939

Inoperable Carcinoma of Rectum. D. C. L. Fitzwilliams.—p. 675.
*Treatment of Epilepsy with Sodium Diphenyl Hydantoinate. D. Williams.—p. 678.
Chemotherapy of Experimental Anthrax Infection. J. C. Cruickshank.—p. 681.
Action of Sulfonamides in Experimental Anthrax. H. B. May and S. C. Buck.—p. 685.
Complete Heart Block in Young People: Report of Two Cases. H. J. Bower.—p. 686.
*Stilbestrol and Anhydro-Oxyprogesterone: Their Effects on Menstruation and Lactation. R. Wenner and K. Joël.—p. 688.

Sodium Diphenyl Hydantoinate in Epilepsy.—Williams decided to try treatment with sodium diphenyl hydantoinate in ninety-one patients with chronic epilepsy who had ceased to respond to other anticonvulsants. The patients all lived at home and had been under regular observation and treatment with other drugs for an average of 6.4 years. The longest continuous period of treatment with sodium diphenyl hydantoinate was ten months and the shortest six weeks, the average duration in eighty-three cases being 4.1 months. Sodium diphenyl hydantoinate was given in capsules of 0.1 Gm. An initial daily dose of 0.2 or 0.3 Gm. was slowly increased, and 0.6 Gm. daily was given in some cases. Phenobarbital and bromides were continued in decreasing doses during the period of substitution, and it was sometimes necessary to reduce the dose of sodium diphenyl hydantoinate and to supplement it with other anticonvulsants. After trial of the drug alone the following medications were found to give an optimum therapeutic effect: sodium diphenyl hydantoinate alone in fifty-two cases, combined with

phenobarbital in nine cases, with bromides in sixteen cases and with phenobarbital and bromides in six cases. As a result of this treatment the fits were reduced in frequency in 79 per cent of the subjects with grand mal and in 63 per cent of those with petit mal. In 19 per cent the improvement was dramatic and has been maintained for over five months. Toxic symptoms arose in 36 per cent, and two patients died in status epilepticus while receiving the drug. The drug seems to be of value in the treatment of epilepsy in some cases when other forms of treatment have failed, but there are no indications that it should supersede the less toxic anticonvulsants in the initial stages of treatment. Its administration requires careful observation of the patient.

Stilbestrol and Anhydro-Oxyprogesterone in Menstruation and Lactation.—Wenner and Joël say that although all investigators agree about the similarity of the properties of stilbestrol to those of the estrogenic hormone, emphasis is constantly laid on the yet unresolved question of dosage. They sought to ascertain (1) the minimal dose necessary to produce proliferation in a resting or atrophic endometrium, (2) the dose necessary to induce a hyperproliferation (in the sense of glandular cystic hyperplasia), and (3) the doses necessary to prevent and to inhibit lactation in the puerperium. At the same time they tried to ascertain the oral dose of corpus luteum hormone (anhydro-oxyprogesterone) necessary to produce the stage of transformation of the endometrium with subsequent menstruation. The authors studied the effect of stilbestrol and of anhydro-oxyprogesterone on the endometrium of one woman who had attained the climacteric thirteen years earlier and on eight women who had been castrated by means of roentgen treatments two or three years previously, when they were over 45 years of age. Each woman was subjected to three curettages: one before treatment was begun, the second after the administration of stilbestrol and the third after treatment with anhydro-oxyprogesterone. They found that in order to obtain proliferation of a resting or atrophic endometrium, it is necessary to give 25 mg. of stilbestrol by mouth or 15 mg. by intramuscular injection. If from 50 to 60 mg. of stilbestrol is given by mouth, a glandular cystic hyperplasia can be produced. The stage of transformation and the menstruation following proliferation can be produced by the oral administration of from 220 to 300 mg. of anhydro-oxyprogesterone. In only two cases did the administration of stilbestrol cause slight secondary symptoms, and even these disappeared rapidly. In the second part of this report the authors describe their studies on the effects of stilbestrol on lactation. Since several investigators had succeeded in either preventing the influx of milk or inhibiting lactation by the administration of estrogenic hormone, the authors decided to use stilbestrol for the same purpose. In six cases (four stillbirths, one case of tuberculosis and one of depressed nipples) they administered stilbestrol on the first day after confinement to prevent the secretion of milk. In three of these c[illegible] one tablet (5 mg.) was given and in the other three, two ta[illegible] (10 mg.). The treatment was successful in all of these ca[illegible]s; no milk was secreted, and the breasts remained flaccid. In fourteen cases stilbestrol was given to inhibit established lactation, the indications being hypogalactia, bleeding fissures, mastitis, eczema of the breasts and tuberculosis. It was found that to arrest lactation, from 5 to 10 mg. of stilbestrol is usually effective, but in some cases larger doses are necessary (not more than 20 mg.). All women took stilbestrol without difficulty, and no secondary symptoms were observed.

Medical Journal of Australia, Sydney

2: 345-382 (Sept. 2) 1939

Emotional Factors in General Medicine. Anita M. Mühl.—p. 345.
Review of 120 Cases of Bronchiectasis in Children in New South Wales. C. Selby.—p. 352.
General Paralysis of Insane in Victoria. F. G. Prendergast.—p. 361.

South African Medical Journal, Cape Town

13: 587-632 (Aug. 26) 1939

"As Others See Us: Doctors and Patients." E. G. D. Drury.—p. 589.
The Hospital Dietitian. G. M. Sedgwick.—p. 595.
Alcohol Injection of the Gasserian Ganglion. A. J. de Villiers.—p. 598.
Incidence of Appendicitis in the Bantu: Some Observations on Its Pathology as Seen in Series of Cases. J. F. P. Erasmus.—p. 601.
Congenital Defect of Sternum. C. J. H. Brink.—p. 606.
Current Views on Gallbladder Disease. J. S. Alexander.—p. 608.
Luxation of Innominate Bone: Case. S. V. Humphries.—p. 611.

Strasbourg Medical

99: 291-302 (Aug. 5) 1939

*New Conceptions on Essential Epilepsy, Its Pathogenesis, Familial Existence and Prophylactic Measures. J. Wertheimer.—p. 291.
Tumor of Left Frontal Lobe: Case. Hélène Weiss.—p. 297.

New Conceptions on Essential Epilepsy.—According to Wertheimer, the term essential or idiopathic epilepsy does not designate a nosologic entity but is generally applied to all cases of epilepsy in which neither the clinical examination nor the history reveals exogenic factors as cause of the attacks. He concludes that essential epilepsy is a sequel of obstetric intracranial lesions, especially of intracranial hemorrhages, which may have escaped observation because their symptoms were slight. Intracranial hemorrhages are often caused by the use of forceps, that is, in extremely retarded deliveries, but they occur also as sequels of extremely rapid deliveries. Studies on the course of labor in epileptic women revealed a high incidence of the precipitate type of deliveries. Thus the infants from epileptic mothers are especially predisposed to intracranial hemorrhages and their consequences. The author shows that this circumstance may give rise to the familial and apparently "hereditary" appearance of epilepsy. However, he maintains that a hereditary epilepsy in the biologic meaning of the term "hereditary" does not exist, the apparent heredity being a result of a vicious circle. After giving the clinical histories of five children he stresses that, as a result of the dorsal position of the nursling, the blood discharged during the cranial hemorrhages settles in the occipital region and remains there like a foreign body until it gradually becomes organized, which may require several months. The cicatrization resulting from this process may produce epileptic attacks. The ventral position of the nursling, on the other hand, facilitates cranial circulation, favors the resorption of the sanguine effusion and thus avoids the cicatrization and the subsequent epilepsy. Placing the nursling in the ventral position is a prophylactic measure against the frequently disastrous sequels of obstetric meningo-encephalic hemorrhages.

Helvetica Medica Acta, Basel

6: 415-524 (Aug.) 1939

Spinal Funiculitis in Endemic Sprue. H. W. Hotz and F. Lüthy.—p. 415.
Perforation of Interventricular Septum by Infarct. G. Bickel and J.-J. Mozer.—p. 427.
Insuloma of Extremity of Pancreas: Case; Can Carcinoma be Caused by Induction? H. Dubois-Ferrière.—p. 458.
*Quantity and Distribution of Hepatic Glycogen in the Newborn. J. Fopp.—p. 466.
Demineralization of Bone Extremities After Trauma Incurred in Accidents as Partial Symptoms of Dystonia and Dystrophy of Extremities. U. Frutiger.—p. 480.

Hepatic Glycogen in the Newborn.—Fopp studied the glycogen content and distribution in late fetal and neonatal livers in eighty cases: twenty-four fetuses with an intrauterine existence from seven to nine months, the remainder (fifty-six) consisting of infants either stillborn or dying within the first twenty-four hours. The majority of the necropsies were performed during the second or third day on bodies kept in refrigeration. Portions of the liver 0.5 cm. in thickness were steeped in a 95 per cent solution of alcohol, embedded in celloidin and tinted according to the Bestsch method. In addition, control analyses were made on fifteen infants who had died within the first month. The results obtained showed glycogen content in the combined late fetal and neonatal livers (eighty) in the following proportions: no glycogen 26 per cent (twenty-one), little glycogen 24 per cent (nineteen), intermediate group 25 per cent (twenty), much glycogen 25 per cent (twenty). The glycogen content for the fetal group taken by itself (twenty-four) indicated about the same percental proportion as for the combined group: no glycogen 21 per cent (five), little glycogen 29 per cent (seven), intermediate group 25 per cent (six), much glycogen 25 per cent (six). These results warrant the inference, confirmatory of the studies made by others, that the glycogen content is often high in fetal livers but give no support to the assumption that high glycogen presence is the "norm." In comparison with the data obtained for the livers of unselected healthy adults accidentally killed, the glycogen content was more frequent and pronounced. On the other hand, tests on the fifteen controls clearly indicated

loss of glycogen, only five attaining to intermediate and high rating. These indications, according to the author, point to a special stability of glycogen retention in neonatal livers and were confirmed by consecutive testings especially made on the liver of another newborn infant at intervals between one and one-half and forty-eight hours. Morphologically, the author finds a close analogy between the glycogen in fetal and neonatal livers and that of adults, with the exception of a complete absence of nuclear glycogen, which he accounts for by the absence of acidosis. Observations made on the hepatic cells of adults could be verified in the livers of the newborn. Evidence for glycogen distribution in the lobule was too conflicting to admit of generalized inferences. Differences between neonatal and adult livers may be due to pathologic processes in adult livers. The author does not seek to explain the great loss in the glycogen content of neonatal livers on a uniform basis. Factors such as prolonged labor, intra-uterine antepartum death, premature detachment of the placenta, febrile infection, marked fatty degeneration and blood congestion in the liver, causing enlargement of the central veins and capillaries, may all cause glycogen impairment while congenital goiter, thymus hyperplasia, sex and the number and size of hemopoietic hepatic centers, except in fetal myeloblastosis, seem not to affect the glycogen content. The evidence for the effect of the size of the liver on glycogen is too meager to justify conclusions.

Schweizerische medizinische Wochenschrift, Basel

69: 805-824 (Sept. 9) 1939. Partial Index

Marble Bone Disease. A. Willi.—p. 805.
*Effects of Ketogenic Diet. M. Julesz and E. Winkler.—p. 807.
Diazotization Speed of Blood Serum. A. Gigon and M. Noverraz.—p. 811.

Ketogenic Diet in Asthma.—Julesz and Winkler studied the effects of a ketogenic diet on fourteen patients (twelve asthmatic) with four healthy persons as controls. Concluding from earlier experiences of their own and others that neither acidification nor dehydration was the key to the problem, the authors turned from investigating the bicarbonate content of the blood to the analysis of ammonia secretion, with the purpose of obtaining a better insight into the metabolic disturbances caused by asthma and into the processes whereby effects are secured through a ketogenic diet. The conditioning of the controls included a standard diet, administration of phosphoric acid, a ketogenic diet for from one to two weeks and repeated tests for ammonia and alkali reserve. In their preliminary assays the authors discovered, on the average, no quantitative difference in ammonia secretion between the controls (650 mg.) and the asthmatic patients who had been put on a standard diet for three days (630 mg.); according to the literature ammonia elimination varies between 400 and 600 mg. Neither did phosphoric acid have any appreciable effect on the daily quota of ammonia excretion. In their study of the effect of a ketogenic diet on ammonia excretion the authors found that in the nonasthmatic controls ammonia elimination during the ketogenic diet was increased by 45 and 50 per cent as compared with the standard diet, continued for from one to two weeks with acetonuria and then decreased, at which time not even increased ketosis could enhance ammonia excretion. The authors differentiate four kinds of ketogenic diet effect on ammonia secretion of asthmatic patients: 1. In patients with normal ammonia secretion under conditions of normal diet, the ketogenic diet increases ammonia secretion considerably. 2. In patients in whom absolute ammonia elimination is normal, the ketogenic diet does not increase it. 3. In patients whose ammonia elimination on a standard diet is subnormal, the ketogenic diet considerably increases it. 4. In patients whose ammonia elimination is subnormal, the ketogenic diet does not affect it. A ketogenic diet was found effective only in patients belonging to groups 1 and 3. Those in groups 2 and 4 were patients affected with serious forms of asthma and were not benefited by the ketogenic diet. In their investigations of the ketogenic diet on the alkali reserve—the latter being defined as the sodium bicarbonate content in the plasma expressed in cubic centimeters of carbon dioxide obtained from 100 cc. of plasma—the authors ascertained that the ketogenic diet diminished the alkali reserve both of asthmatic and of nonasthmatic persons by from 1 to 20 per cent. The exceptional detection of an increased alkali reserve after from one to two weeks of the ketogenic diet, amounting in one case to 24 per cent, is explained by the authors on the assumption that the organism, under the influence of the ketogenic diet, adjusts itself so much to neutralizing acidity by means of ammonia that after a time it impairs its power to neutralize with bicarbonate. They appeal for confirmation of their assumption to the results obtained from the phosphoric acid administration during the conditioning period and to the abnormal reaction of some of the asthmatic subjects.

Archivio Italiano di Chirurgia, Bologna

56: 237-338 (May) 1939. Partial Index

Regional Enteritis. E. Ragnotti.—p. 237.
Importance of Circulation on Formation of Bone Callus: Experiments. M. M. Reggiani.—p. 272.
*Abdominal Syndromes from Adenopathies of Mesentery. A. Parini.—p. 314.

Abdominal Syndromes from Mesenteric Adenopathies.—According to Parini there are certain acute forms of adenopathies of the mesentery with symptoms simulating those of acute appendicitis and also forms with abscess formation and possible rupture of the abscess and consequent peritonitis. The condition is generally found in children and adolescents, although it may be seen in adults. The enlarged mesenteric lymph nodes can be felt by palpation only in rare cases. The differential diagnosis of mesenteric adenopathies with acute appendicitis is made from the type of pain, which is of an intermittent character and located in the ileocecal or periumbilical region rather than in the appendicular region. The presence of leukocytosis with lymphocytosis is of diagnostic value. Mesenteric adenopathies may be secondary to tuberculosis, chronic inflammation of certain abdominal organs, or else chronic infection of the throat, teeth, respiratory tract or intestine. The treatment is etiologic, namely chemotherapy, especially sulfanilamide, in infection and medical, physical and other treatments in tuberculous adenopathies. In the latter the treatments indicated are administration of iodide, exposure of the patient to sun irradiations, administration of roentgen irradiations, sojourn of the patient in the proper climate and proper diet and general hygiene. Surgical intervention is indicated only in acute forms in the presence of (1) intestinal obstruction or stricture from compression of the enlarged lymph nodes or from adhesions, (2) acute suppuration, especially if there is a menace of rupture of a lymphatic abscess, or (3) peritonitis from rupture of an abscess. It is advisable to establish ample drainage after the operation. It is also advisable to resort to surgical intervention only in the specified conditions mentioned, since removal of enlarged lymph nodes may be followed by production of hemorrhages or development of necrosis, suppuration or formation of adhesions. Five cases of either the tuberculous or the infectious etiology are reported by the author.

Giornale Medico dell'Alto Adige, Bolzano

11: 241-308 (May) 1939. Partial Index

Roentgen Examination in Study of Intestinal Occlusion from Ascariasis. A. Barbieri.—p. 241.
Variations of Glycemia in Relation to Peristalsis and Gastric Tonus. A. Bauce.—p. 260.
*Treatment of Open Fractures. A. Chiatellino.—p. 283.

Treatment of Open Fractures.—Chiatellino has treated more than fifty cases of open fractures in the course of the last four years. The group included open fractures of the large bones (with exposure of the articular cavity in some cases) and open and comminuted cranial fractures. There were some diabetic and old persons in the group. The treatment, a modification of Böhler's, consists of surgical disinfection of the soft parts of the wound and of the bone tissues followed by complete suture of the wound. The operation is performed in the following manner: General care is given to the patient to prevent development of traumatic shock. The local region of the skin is sterilized with iodine (without any previous irrigation on the wound and nearby tissues). Anesthesia by infiltration is abundantly administered by using a 0.25 per

thousand solution of nupercaine. A roentgenogram of the fracture is made. All contused and contaminated tissues of the wound are removed and the edges of the wound are cleansed and made regular. The bone fragments are surgically disinfected, the small fragments are removed and those of moderate and large size are replaced. Ligation is done only when there are sectioned nerves or sectioned blood vessels. No foreign matter (of osteosynthesis or sutures) is left in the focus of the fracture. The skin is then sutured with silk stitches. In some cases it is advisable to leave one or various draining tubes. If so, they are placed in an inclined position. The fracture is then reduced and the limb immobilized in a cast with a window over the wound. In some cases transskeletal traction can be resorted to for the first twenty days, after which the fracture is managed as a closed fracture. In some of the author's cases the articular cavity was open and was treated by detersion with swabs soaked in ether. Cranial fractures were complicated in four cases by opening of the frontal sinuses, which were properly treated during the operation. Osteomyelitis of the bone fractures did not take place in any case, the process of healing was uncomplicated and both healing and regaining of use of the limb took no longer than when treated by any other method employed in open fractures. The author considers this the treatment of choice for open fractures.

Deutsches Archiv für klinische Medizin, Berlin

184: 369-488 (Aug. 1) 1939

*Anemia in Renal Diseases: Catabolism of Blood in Patients with Pale Hypertension and in Transitional Forms from Red to Pale Hypertension. H.-E. Bock and Lotte Weyand.—p. 369.
Modification of Mineral Economy and of Lead Content in Acute and Chronic Lead Poisoning by Sodium Thiosulfate. Frida Schmitt and H. Lossie.—p. 405.
Clinical Significance of Weltmann's Coagulation Band. B. Brendel.—p. 433.
Formation of Fat from Carbohydrate in Fat Organs. K. Felix and W. Eger.—p. 446.
Value of Biologic Reactions in Alveolar Echinococcus. F. Henri.—p. 458.
Pneumonia Caused by Thomas Slag Meal. A. Kahlstorf.—p. 466.

Catabolism of Blood in Hypertension.—Bock and Weyand studied the exchange of the blood pigments of patients with pale hypertension, in whom the renal function was impaired, and in those who had transitional forms from red to pale hypertension. They employed Heilmeyer's method, which determines the urobilin elimination per hundred grams of circulating hemoglobin and designates the result as the "index of urobilin catabolism." However, they complemented Heilmeyer's method by determination of the resistance and by measuring the median diameter and the volume of the erythrocytes, the thickness diameter and the spherical index. In some cases they also determined the iron content of the serum and bone marrow and examined myelograms and the circulatory conditions. Summarizing their observations they say that five cases of malignant nephro-angiosclerosis (Volhard's pale hypertension) in which there was an average blood pressure of 213/129 mm. of mercury and with typical angiospastic retinitis showed a noticeable increase in the catabolism of the blood. The total mass of erythrocytes was decreased but the plasma was increased. The values for hemoglobin, erythrocytes and the color index indicated anemia. The erythrocytes were pale and thin; their volume was reduced although the plane diameter was normal. Since the increased catabolism of the blood was accompanied by only a slight increase in the percentage of reticulocytes and since they were all comparatively old cells with vital granulation, the authors assume rapid aging of the reticuloyctes or a retarded elimination from the bone marrow. The tendency toward augmentation of the index of urobilin catabolism and toward the reduction in the total quantity of erythrocytes was the greater, the more severe was the impairment of the renal function. In seven patients with an average blood pressure of 192 systolic, 98 diastolic who, on the basis of the changes in the fundus oculi, had to be regarded as belonging to the group with transitional forms from red to pale hypertension, the catabolism of the blood was found to be near or noticeably above the upper limits of normality. The total mass of erythrocytes was decreased, but there was hardly any compensatory increase in plasma and no increase in the total quantity of blood. In contradistinction to the patients with pale hypertension, these patients with the transitional forms show no impairment of the hemoglobin content or the erythrocyte count. Their erythrocytes resemble morphologically those of the patients with pale hypertension. The reticulocyte numbers are higher and there are more young forms than in typical malignant sclerosis, that is, the compensatory functions are more favorable. In a patient with red hypertension in whom the pressure was 180/90 and the renal function good, the blood exchange was near the upper limit of normality and the mass of erythrocytes and of plasma was normal. There was no anemia and the percentage of reticulocytes was normal, as was also the form of the erythrocytes. Three patients with chronic glomerular nephritis with an average blood pressure of 160/88 and with a normal fundus oculi showed a greatly increased hematic catabolism, like the patients with nephro-angiosclerosis, and a greater reduction in the total mass of erythrocytes and plasma. The anemia of these patients was more severe than that of patients with malignant sclerosis, although the retention of urinable substances was less or even lacking. The authors believe that the factor which is most important for an increase in the catabolism of the blood is not the impairment of the erythrocytes in the presence of contracted vessels but rather the retention of urinable substances. They found that the greater the increase in indican, the greater is also the index of urobilin catabolism. To be sure, observations in several cases of nephritis and malignant sclerosis indicate that the factor of "renal insufficiency" is not necessarily delayed until after the indican test of the serum is positive. The author observed an increase in the catabolism of the blood and a decrease in the mass of circulating erythrocytes even in the absence of indicanemia. In cases of chronic nephritis the increased hematic catabolism was accompanied not only by an insufficient replacement of erythrocytes (as in cases of malignant nephrosclerosis) but also by an inadequate restoration of plasma.

Endokrinologie, Leipzig

22: 1-80 (July) 1939

Pars Intermedia of Human Hypophysis and Remarks on Origin of Hypophysial Hormones. W. Berblinger.—p. 1.
Influence of Hypophysectomy on Minimal Dose of Testicular Hormone in Male Castrates. C. Müller.—p. 14.
*Investigations on Hormone of Lactation of Anterior Lobe of Hypophysis. K. Ehrhardt and H. F. Voller.—p. 19.
Investigations on Modification of Structure of Thyroid by Vitamin C. M. Schöber.—p. 24.

Lactation Hormone of Anterior Lobe of Hypophysis.—The investigations presented by Ehrhardt and Voller concern the presence of the hormone of lactation in the blood and urine. The hormone was extracted according to the method of Lyons and Page and was injected under the skin of the crop of young pigeons. In contradistinction to other investigators, the authors did not regard the appearance of so-called crop milk as indicator, but rather the microscopically demonstrable hypertrophy of the cutaneous papillae of the crop and the formation of secondary papillae. They first examined specimens of blood and urine, which were obtained from nulliparous women who had a regular twenty-eight day cycle. Further they investigated the occurrence of the lactation hormone in pathologic processes, such as abortions, and finally they tested the action of the hormone of lactation in guinea pigs. Summarizing their results, they point out that the occurrence of the hormone of lactation in blood and urine shows two maxima in the course of the menstrual cycle, one at the onset of menstruation and one at the time of the rupture of the follicle. Investigations in connection with abortions and with glandular cystic hyperplasia revealed that the hormone of lactation appears in especially large quantities during processes of decomposition in the genital organs. In pregnant guinea pigs the hormone was found to have an abortifacient effect, but it was also possible to influence the mammary glands of pregnant guinea pigs in that they were brought prematurely into that stage which physiologically coincides with the "shooting in" of the milk. The authors suggest that the hormone of lactation not only exerts a specific action on the mammary tissue but probably has functional significance also in the menstrual process. This raises the question of the relationship of the hormone of lactation to the estrogenic hormone and to the corpus luteum hormone. The authors found that the hormone of lactation appears when the action of the two other

hormones ceases, which would seem to indicate that the processes in the female genitalia are influenced not only by the estrogenic and the corpus luteum hormones but at times also by the hormone of lactation. On the basis of their observations the authors suggest that lactation hormone of the anterior lobe of the hypophysis acts not only on the mammary gland but at times also on the ovary and the uterine mucosa in that it is involved in the rupture of the follicle and in the menstrual decomposition of the uterine mucosa.

Folia Haematologica, Leipzig

62: 337-480 (No. 4) 1939

*Myelogenic Osteopathy: Clinical and Experimental Study. N. Markoff. —p. 337.
Cholesterol Content of Erythrocytes in Human Subjects. G. C. Brun.—p. 367.
Complex of Symptoms of Panmyelophthisis During Childhood. T. Illing. —p. 369.
Experimental Changes in Opsonic Index. V. Papilian and I. G. Russu. —p. 392.
*Blood Picture During Alarm Reaction. A. J. Dalton and H. Selye.—p. 397.
Problem of Megaloblasts. H. E. Bock and B. Malamos.—p. 408.
Experiences with Coagulation According to Weltmann at Medical Clinic of University of Zurich. T. Keller.—p. 430.

Myelogenic Osteopathy.—Markoff directs attention to recent advances in the knowledge on the relationship between osteal and medullary structure and functions, pointing out that the intravital examination of the bone marrow according to Arinkin's method permits an evaluation of the morphology and function of the medullary tissue. A comparison of the osteal structure and of the morphology and function of the medullary tissue shows a coupling between medullary and osteal changes under physiologic and under pathologic conditions. This connection is designated by the author as the medullary-osseous relation. Functional activity and morphologic aspects run parallel under physiologic conditions, though a study of the various forms of osteopathy reveals a diverging development between osteal and medullary changes. The author gives his attention to the medullary-osteal relationship in various forms of osteopathy. He demonstrates that in osteoporotic processes the marrow is not atrophic and hypo-active but rather hyperplastic and hyperactive. In studies on different forms of osteopathy, he shows that the myelogenic factor is of decisive influence in the pathogenesis of these forms of osteopathy. If the functional relationship between the medullary and osteal tissues is impaired, there develops a syndrome which can be designated as myelogenic osteopathy. The author thinks that the syndrome of myelogenic osteopathy represents a proof of Naegeli's hypothesis of the medullary origin of osteomalacia. He further shows that the idea of hematic dysplasia, which Gänsslen formulated for the age of growth, applies in a slightly different form also to adults, except that here there is not a single functional direction from bone marrow to bone but relations between cellular marrow and osteoporosis and between fibrous marrow and osteosclerosis.

Blood Picture During Alarm Reaction.—Dalton and Selye say that it has been shown that acute damaging stimuli (such as exposure to cold, muscular exercise, toxic doses of drugs, hemorrhage and surgical intervention) elicit a group of typical symptoms. The most characteristic among these are enlargement of the adrenal cortex with a decrease in its lipid content, loss of chromaffinity of the adrenal medulla, acute involution of the thymus, the lymph nodes and the spleen, formation of ulcers in the gastrointestinal tract, hemoconcentration, and characteristic changes in the chemical composition of the blood. The fact that, irrespective of the type of damaging agent, the resulting symptoms are always approximately the same, led to the conclusion that they are merely the somatic expression of the response of the organism; that is, a hitherto unrecognized generalized reaction of the body. These considerations, and the fact that the reaction can be elicited only by the first exposure and disappears in subsequent exposures, suggested the name "alarm reaction." Since previous investigations had shown that one of the best indexes of an alarm reaction is the blood count, the authors decided to investigate the hematologic changes of the alarm reaction in experiments on animals. They found that following exposure to an agent such as formaldehyde, which elicits a typical alarm reaction, there is an initial decrease in the total white cell count followed by an increase which is mainly due to neutrophil leukocytosis. At the same time the red cell count rises because of the accompanying hemoconcentration. This rise may be preceded or interrupted by a transitory decrease during the first hour of the experiment. In the case of an alarm reaction produced by muscular exercise, the changes in the white cell count are similar to those elicited by formaldehyde but the red cell count shows a progressive and prolonged decrease, which has not as yet returned to normal even seventy-two hours after the one hour period of exercise. During the neutrophil leukocytosis, eosinophilopenia develops in most cases, the eosinophils reaching their lowest level (they almost disappear from the blood) before the neutrophils reach their peak. After this, eosinophilia ensues at a time when the neutrophils are returning to normal. Reticulocytes increase in number during the alarm reaction, this increase being much more obvious after exercise than after treatment with formaldehyde. It appears that the so-called nonspecific leukocytosis, preceded by a decrease and followed by an increase in eosinophils, is a constant feature of the alarm reaction.

Klinische Wochenschrift, Berlin

18: 1077-1108 (Aug. 12) 1939. Partial Index

Structural Analysis of Coagulation of Blood. C. Wolpers and H. Ruska. p. 1077.
*Behavior of Gastrointestinal Tract in Lead Poisoning: Intestinal Disturbances. H. Otto and F. Kuhlmann.—p. 1081.
Electrolytic Equilibrium of Serum in So-Called Serum Inflammation. E. Poli.—p. 1084.
Alimentary Fluctuations in Leukocytes and Acidity Conditions of Stomach. B. G. Hager.—p. 1087.
Investigations on Albucid (Sulfanilamide Derivative) Contents of Blood and Urine After Administration of Albucid in Gonorrhea and Their Significance for Therapeutic Result. W. Gertler.—p. 1089.
Extraction of Protein Substances from Diphtheria Bacilli. K. Soehring. —p. 1093.
Disturbances of Mitosis in Tissue Cultures Produced by Carcinogenic Hydrocarbons and by Sex Hormones. W. von Moellendorff.—p. 1098.

Gastrointestinal Tract in Lead Poisoning.—Otto and Kuhlmann first discuss the different ways by which lead can enter the human organism, mentioning absorption by the lung, the mouth and the skin. Whether the severity of the gastrointestinal disturbances depends on the mode of intake of the lead has not been determined as yet. The oral changes, although of diagnostic significance, do not greatly trouble the patient, whereas the esophageal symptoms have been known to do this. Lead esophagitis, for instance, causes retrosternal pressure, pyrosis and, in rare cases, regurgitation. Spasmodic contractions and even paralysis of the esophagus have been observed as the result of lead poisoning. Inflammatory changes of the internal wall of the stomach are a frequent symptom of lead intoxication. Moreover, gastritis and ulcers have been known to develop in lead poisoning. Reviewing the intestinal disturbances resulting from lead poisoning, the authors give their attention especially to the localization of the lead colics. They reject the generally accepted opinion that the lead colics are localized exclusively in the colon and show that the small intestine is involved. They point out that the patients often localize the spasmodic pains in the region of the umbilicus and of the hypogastrium and that the intestinal pains fail to subside after complete evacuation of the colon. The roentgenologic observations demonstrate even more clearly that the small intestine is involved. For instance, in patients with lead poisoning who were troubled with continuous and severe colics roentgenoscopy failed to reveal colonic spasms but disclosed segmental constrictions and spasms of the small intestine. Cases of definitely established ileus of the small intestine are further proof of the significance of lesions of the small intestine in lead intoxication. The authors further discuss the different modes of development of the disturbances in the small intestine. They consider (1) the direct irritation of the mucosa and of the muscular layers, (2) the irritation of Meissner's and Auerbach's plexus, (3) the impairment of the vagus and sympathicus, (4) lesions of the brain and spinal cord, (5) vascular crises and (6) increased hepatic elimination of porphyrin into the small intestine. The differential diagnosis of lead colic must consider such conditions as biliary and renal calculi, perityphlitis, pancreatic disorders, embolism of the mesenteric vessels, gastric crises and acute porphyria. In the treatment of colic of the small intestine it is necessary to differentiate between the acute and chronic forms

of lead poisoning. The severe pains of acute colic should be counteracted by opium and atropine preparations. Since vascular spasms are involved, amyl nitrite, sodium nitrite and glyceryl trinitrate are advisable. The treatment of constipation is difficult, because the purgatives may increase the intestinal pains. The authors advise against castor oil and croton oil and prefer purgative teas and salts. In case of chronic lead poisoning, removal of the lead depots by means of iodine preparations is an important factor. To be sure, this mobilization of lead may bring on acute attacks. If this is the case, the iodine therapy should be interrupted. The diet of these patients should consist chiefly of vegetables, fruits and eggs. The quantities of food should be moderate.

Novyy Khirurgicheskiy Arkhiv, Dnepropetrovsk

44: 1-96 (No. 173) 1939. Partial Index

*Ether Oil Injection Method of Treatment of Biliary Lithiasis. M. A. Topchibashev.—p. 11.
Acute Appendicitis: One Thousand Cases. S. P. Sychev.—p. 20.
Electrocoagulation Treatment of Angioma. D. A. Barkov.—p. 32.
Strumectomy as Cosmetic Operation. A. P. Gridnev.—p. 38.
Endemic Goiter in Northeast Portion of Kubashev and in Northeast Portion of Orenburg Provinces. A. A. Brzhozovskiy.—p. 44.
One Stage Operation for Bilateral Ureteral Stones. S. P. Portugalov. —p. 49.
Gas Phlegmon. A. M. Barbolin and A. I. Shchekoturov.—p. 56.

Ether Oil for Biliary Lithiasis.—According to Topchibashev, a pure cholesterol stone placed in a test tube containing ether became dissolved in one and one-half hour's time. Combined stones required from three to four hours. Of 120 stones experimented with, 7 per cent failed to dissolve. When sectioned, these stones displayed several layers. When the upper crust of such a stone was removed, solution of the rest took place in from three to four hours. It was further established that stones dissolved in ether vapor as well as in fluid ether. Gallstones kept in bile removed from the gallbladder of a dog did not undergo any change. Stones from the same clinical case were placed in the gallbladder of a dog and 1 cc. of ether was administered hypodermically for the next fifteen days. The stone removed at the end of the period showed definite changes and diminution in size. A control experiment showed no alterations in the appearance and size of the stone. Gallstones placed in 5 cc. of blood removed from a patient before ether narcosis showed no alteration, whereas stones of the same origin placed in 5 cc. of blood from the same patient after he had been etherized dissolved completely in the course of a few hours. Between 1933 and 1939 the author treated 150 cases of biliary lithiasis by daily hypodermic or intramuscular injections of an emulsion of 3 cc. of ether and 2 cc. of olive oil. This was continued for from fifteen to thirty days. A favorable result was obtained in 132 (88 per cent) of the cases.

Acta Medica Scandinavica, Stockholm

101: 105-320 (Aug. 27) 1939. Partial Index

Aneurysm of Cerebral Arteries and Polycystic Kidney. I. Snapper and P. Formijne.—p. 105.
Eosinophilic Leukemia. S. Thomsen and P. Plum.—p. 116.
*Osteomalacia of Spinal Column from Deficient Diet or from Disease of Digestive Tract: I. From Deficient Diet. E. Meulengracht.—p. 138.
*Id.: II. Osteomalacia Achylica. E. Meulengracht.—p. 157.
*Id.: III. Osteomalacia and Abuse of Laxatives. E. Meulengracht. —p. 187.
*Cardiovascular Changes in Essential Hypertension, with Special Reference to Electrocardiogram in Hypertension. H. Rasmussen and R. Thingstad.—p. 237.
Histopathologic Investigations in Icterohemorrhagic Spirochetosis with Special Consideration of Vascular Disturbances. G. W. Kastein and A. J. C. Haex.—p. 256.
Influence of Urethane on Metabolic Action of Thyroxine and Dinitrophenol. N. Alwall and S. Sylvan.—p. 290.
*Basophil Stippling of Erythrocytes in Sulfanilamide Anemia. H. Myhre.—p. 315.

Spinal Osteomalacia from Deficient Diet or Disease.—Meulengracht presents a series of three articles on osteomalacia of the spinal colum. In the first one he reports observations on six patients who had lived on a diet which was more or less unbalanced and qualitatively poor or incomplete. In the second one he describes observations on eight patients who had lived on a somewhat insufficient diet and who in addition to this had gastric achylia. In the group of patients presented in the third report the diet may have been unbalanced, but these patients are of interest especially because their histories revealed the continual use or abuse of laxatives. The osteomalacic changes were located chiefly in the spinal column. The subjective symptoms were pain in the back and loins, sometimes occurring in acute attacks. In the majority of the cases, external examination disclosed collapse of the back and in some this was associated with kyphosis. A considerable reduction in the height of the body was often noted as well. X-ray examinations revealed calcium deficiency of the skeleton, which was most marked in the spinal column. The vertebrae were narrow, biconcavely excavated or more irregularly deformed. In several cases roentgenoscopy disclosed secondary osteo-arthrosis of the lumbar spinous processes due to collapse and shortening of the lumbar vertebral column. The author thinks that he is right in regarding osteomalacia as the result of dietetic deficiencies, more especially of an insufficient amount of, or an unsuitable proportion between, the calcium, phosphorus and vitamin D in the food. In this connection he cites several investigators, who pointed out that the diet of the Danish population is deficient in calcium, phosphorus and vitamin D. He believes that osteomalacia is by no means a rare disease and stresses that it must be borne in mind that, as is the case in other diseases due to dietetic deficiencies, in addition to the few manifest cases there is a large number of latent cases. Dietetic deficiencies were not the only cause of the osteomalacia in the cases under consideration. Abnormal conditions in the digestive tract, such as gastric achylia or the abuse of laxatives, which impaired the absorptive processes, contributed to or were the chief causes of the malady. Treatment with calcium salts and vitamin D improved or banished the pain and disablement caused by the spinal osteomalacia.

Cardiovascular Changes in Essential Hypertension.—Rasmussen and Thingstad examined 100 patients with essential hypertension as regards cardiovascular changes. They investigated the cardiac function, the size of the heart, the electrocardiogram, the breadth of the aorta and the calcareous deposits in the aorta and the tibial arteries. Only 8 per cent of the patients were free from pathologic changes in the cardiovascular system. The degree of cardiac enlargement and of the electrocardiographic changes was found to be independent of the height of the blood pressure. A study of the relationship between electrocardiographic aspects and the size of heart revealed some important points regarding the pathogenesis of the electrocardiographic changes in hypertension. The authors show that the electrocardiograms of hypertensive patients can be grouped into four distinct types, characterized by various alterations in the QRS complex, the ST segment and the T wave. The types seem to represent different stages of the same evolution. A closer examination of the relation between these four electrocardiographic types and the cardiac enlargement revealed a strong correlation between these types and the size of the heart. Thus types I and II with comparatively small changes in the electrocardiogram corresponded to slight and moderate enlargement of the hearts, while the patients with gross changes in the electrocardiogram, type III ("left ventricular preponderance curves") and type IV ("electrocardiogram of the bundle branch block of the common form") had the largest hearts. Consequently the authors believe that the electrocardiographic changes described as characteristic of the electrocardiogram of hypertension are due to varying degrees of left ventricular enlargement (dilatation and/or hypertrophy) and are not due to disease of the coronary arteries. The electrocardiogram of the bundle branch block of the common type (type IV) was observed in seven of 100 hypertensive patients. An analysis of the seven cases together with another group of twenty-one cases with this electrocardiographic picture revealed that all twenty-eight cases with "electrocardiogram of the bundle branch block of the common form" were characterized by gross left ventricular enlargement. The chief cause of "electrocardiogram of the bundle branch block of the common form" (classic terminology: right bundle branch block) is supposed to be severe left ventricular enlargement.

Basophil Stippling of Erythrocytes in Sulfanilamide Anemia.—According to Myhre it is a well known fact that anemia may occur in connection with sulfanilamide treatment. Having observed basophil stippling of the erythrocytes in studying the blood of a woman who developed granulocytopenia after taking 19 Gm. of sulfanilamide, the author decided to examine the blood of patients with slowly developing sulfanilamide anemia for basophil stippling. In the first patient the highest count of stippled cells was 3,200 per million erythrocytes. In the second patient, a girl aged 17, who was given large doses of sulfanilamide in the course of meningitis, after having previously received it in an attack of tonsillitis, the stippled cell count reached the maximum of 6,500 per million erythrocytes. Two other patients who had received sulfanilamide for pyelitis showed a moderate increase in stippled cells (1,000 and 700 per million erythrocytes, respectively). In two other patients, in whom the total dose of sulfanilamide was unknown, the treatment having begun previous to hospitalization, the stippled cells reached a total of 3,000 per million erythrocytes. The author counted the stippled cells by means of Schmidt's method. He says that the phenomenon of stippling is an acknowledged sign of blood regeneration but that he has never seen it in connection with anemias secondary to infections but only in toxic anemias. Lead poisoning, the most common cause of stippling, could be excluded in the reported cases. In these patients, who had received sulfanilamide, the stippling was unusually fine. The stippled cells are not identical with reticulocytes but may appear simultaneously. The author suggests that the rapid increase in stippled cells (6,500) and reticulocytes observed in one of the patients may have been the result of the treatment with liver extract. He never observed stippling after the customary doses of sulfanilamide. Nevertheless, the reported cases show that sulfanilamide may have a profound influence on the hemopoietic system, even if no alarming anemia occurs.

Nordisk Medicin, Helsingfors

3: 2305-2374 (July 29) 1939. Partial Index

Hospitalstidende

*Treatment of Pneumonia in Adults and Children with Acetyl Sulfapyridine. A. Eldahl.—p. 2309.

Investigations on Active Spectral Range in Phytogenic Photodermatosis Due to Pastinaca Sativa (Oppenheim's Dermatitis Striata Bullosa Pratensis). T. Jensen and K. G. Hansen.—p. 2314.

Eleven Cases of Incomplete Menstruation. Karen Røjel, née Formann.—p. 2319.

Treatment of Pneumonia with Acetyl Sulfapyridine.—Eldahl says that of the fifty-five patients treated with acetyl sulfapyridine thirty-four were adults and twenty-one were children. Pneumococcus types I, III, VI, VII and XIX were found respectively in ten, five, eight, seven and five cases (21, 10.4, 16.4, 14.6 and 10.4 per cent). The average amount given adults was 40 Gm. and children 25 Gm. In twelve patients (22 per cent) the temperature dropped to 38 C. (100.4 F.) during the first twenty-four hours of treatment, in twenty-five (45 per cent) in the course of the second day. Two patients with pneumococcus types III and XVIII respectively died in the acute stage, with a resulting mortality rate of 3.6 per cent. The toxic symptoms were vomiting in thirteen cases, hematuria in one; whether the jaundice which occurred in one instance was due to the drug or to an acute infectious hepatitis could not be determined.

Norsk Magasin for Lægevidenskapen

*Infraclinoidal Aneurysm of Internal Carotid—Ophthalmoplegic Migraine. B. Nyquist, S. B. Refsum and A. Torkildsen.—p. 2325.

Treatment of Pellagra with Nicotinic Acid: Clinical Review with Report of Case. A. H. Brinchmann.—p. 2335.

Several Kinds of Block, Interference and Paroxysmal Tachycardia in Same Person. J. H. Vogt.—p. 2337.

Significance of Material for Degree of Sensitivity of Single Pirquet Reaction with 1 Mg. Tuberculin. G. Hertzberg.—p. 2340.

Infraclinoidal Aneurysm of Internal Carotid—Ophthalmoplegic Migraine.—Nyquist and his associates say that the accepted conception of the syndrome of ophthalmoplegic migraine as due to infraclinoidal aneurysm was expressed by the Norwegian Eduard Bull in 1877. Six cases of infraclinoidal aneurysm associated with typical symptoms are reported. In five the symptoms began with pain corresponding to the first branch of the trigeminal nerve, followed by palsy of the oculomotor nerve. Exophthalmos was present in all but one case. One case, with bilateral aneurysm, is believed to be the fifth of its kind to be reported. The symptomatology is marked by two phases, (1) the acute episode due to rupture of the aneurysm and (2) symptoms due to pressure of the aneurysm on the neighboring structures. The history is often characteristic of a vascular disorder and suggests the diagnosis. Verification of the diagnosis depends on arteriographic, operative or postmortem establishment of the aneurysm. Treatment consists of ligation of the artery central to the aneurysm, the primary aim being to prevent future ruptures. This possibility is always at hand and the prognosis as far as life is concerned is doubtful.

3: 2375-2460 (Aug. 5) 1939. Partial Index

Hospitalstidende

Bacteriologically Controlled Experiments to Change Abnormal Intestinal Flora by Administration of Bacillus Acidophilus (Thermobacterium Intestinale, Orla-Jensen) in Therapeutic Doses. E. Mejlbo and F. Nygart.—p. 2383.

*Studies on Certain Pneumococcic Antibodies (Agglutinin and Capsular Swelling Antibodies). Emilie Faber.—p. 2391.

Symptoms and Treatment of Roentgen Climacteric. Johanne Christiansen.—p. 2295.

Autochthonous Sinus Thrombosis as Postoperative Complication. K. E. Petersen.—p. 2398.

Pneumococcic Antibodies.—In her investigations on the pneumococcus agglutinins and capsular swelling antibodies of types I to XXXII in serums from 100 healthy persons, Faber found antibodies against one or more types, with titers of from 2 to 16, in 18 per cent. The presence of antibodies of a certain type in the postcritical serum of a pneumonia patient, she says, does not establish this pneumococcus type as the etiologic factor in the pneumonia unless antibodies of this type were demonstrated in the blood before the crisis.

3: 2461-2516 (Aug. 12) 1939. Partial Index

Hospitalstidende

*Hematuria in Treatment with Sulfapyridine. N. I. Nissen and C. R. Roesgaard.—p. 2461.

Inhibiting Action of Liquid Petrolatum in Utilization of Substances with Active Vitamin A. T. K. With.—p. 2468.

Hematuria from Sulfapyridine.—Nissen and Roesgaard state that on examination of the daily urine of forty-one patients, mostly with various types of pneumonia, all treated with sulfapyridine, hematuria was demonstrated in fifteen: macroscopically in five and microscopically in ten. In two cases the hematuria was accompanied by subjective symptoms of kidney disease (renal colic and anuria respectively). As a rule the hematuria lasted only a day or at the most a few days; there was no lasting symptom of any kidney lesion in the surviving patients. As the urine after a few days intensive treatment with sulfapyridine often changes from a dark brown to a reddish brown, a slight hematuria may easily escape observation unless daily tests of the urine are made. If the indication for continuation of the treatment is not vital, discontinuance of the drug is advised on the slightest sign of hematuria.

3: 2517-2592 (Aug. 19) 1939. Partial Index

Hospitalstidende

Diagnosis of Gastritis: Comparative Investigation of Gastroscopy and Other Diagnostic Aids. K. Lundbæk.—p. 2517.

*Studies on Type III Pneumococcus Pneumonia. G. Allsted.—p. 2523.

Type III Pneumococcus Pneumonia.—Alsted reports thirty cases of type III pneumonia (sixteen of the lobar form, fourteen of bronchopneumonia) treated in Bispebjerg Hospital in the same period with twenty-four cases of type I pneumonia (all lobar) and nineteen of type VII pneumonia (eighteen of lobar form, one of bronchopneumonia). He says that type III apparently predominates in women and in older persons, although the mortality rate is highest among the middle aged. In type I and type VII pneumonia two thirds of the patients were under 40. Type III is regarded as a special clinical and pathologic entity, differing distinctly from types I and VII, which generally have a less dangerous course and may be more easily influenced by specific treatment. The most rational treatment at present for type III pneumonia appears to be an energetic chemotherapy, instituted as early as possible in the course of the disease; specific therapy, however, seems to be without notable effect in bronchopneumonia.